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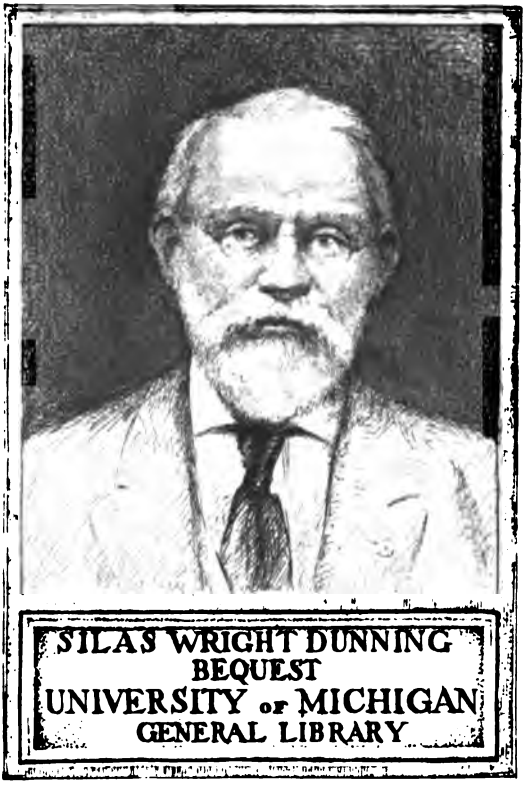

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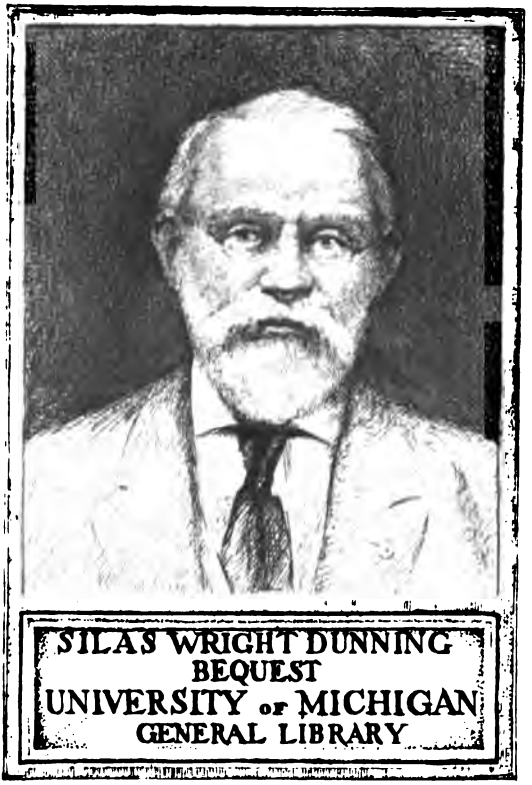

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II

TRANSACTIONS

OF THE

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no. 2

Literary and Historical Society,

OF QUEBEC.

SESSION OF 1863-4.

NEW SERIES.—PART 2.

Quebec:
PRINTED BY HUNTER, ROSE & CO.
1864.

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TRANSACTIONS

OF THE

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SESSION OF 1863-4.

PAPER I.—OPENING ADDRESS.

BY JOHN LANGTON, M.A., PRESIDENT.

WE have arrived at that period of the year when we are to resume our regular meetings, and it becomes my duty to open the session by an address from the chair. Nothing of moment, affecting the interests of the society, has occurred since I last addressed you, and since the report of the Council was presented at the commencement of the year. We have expended the amount received on our insurance in the purchase of works of established reputation in the leading branches of literature and science; and though our library is still very imperfect in some departments, and though we have to regret the loss, by the late fire, of many valuable books, which we may never be able to replace, yet, upon the whole, I think that our collection will be found more generally useful than it was before that calamity. It is certain that the

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library is much more frequently resorted to by members than was formerly the case, which may, to some extent, be accounted for by the more convenient situation of our apartments; but the greater variety of subjects which are now represented on our shelves, and the more modern character of most of the publications, are, no doubt, the chief reasons. The rapidity with which the book on our table is filling up, in which members enter the volumes they take out, is a convincing proof of the usefulness of the library, and I hope that it will induce us, now that a nucleus is once formed, to employ as much as can be spared annually from our funds, in adding to it, from year to year, the latest authorities upon the several subjects which are embraced within the scope of the plan we have laid down for ourselves. We may thus hope that in time the city of Quebec may possess a public library, in which the best books on the most important branches of literature and science may be accessible.

We have also made some commencement towards reconstructing our museum; but a well-selected museum is necessarily of slow growth, and the state of our funds has cramped our means of progress. The collections which may be accumulated both in a library and in a museum are practically infinite, and where the means and the accommodation are limited, the utility of both is very much diminished, unless they are formed upon a well considered plan, adapted to our capacity. In both it is far better to have a limited number of departments, all adequately represented, than to embrace a larger range of subjects, and to leave them all imperfect. But it is much easier to pursue a consistent system of this kind with a library, than with a museum. It is true that, even in a limited number of departments, or even in one department, the books which may be collected are endless; but books of value —the books of real authority—are, after all, not so very numerous. In a great national library it is doubtless desirable to possess everything that has been written; and if the student can extract from a book comparatively worthless a stray fact or a useful illustration, it has not been stored up in vain. But to the general reader the

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structure, which has been built up by that student from his scattered materials, is of much more importance than the materials themselves; and even a few dozen well selected works, giving the results of the latest researches upon any subject, would be of themselves a valuable possession. But it is not so with a museum, which is essentially a collection of details. A single book may classify or generalize from a multitude of facts, and may nearly exhaust the subject; but a museum contains the facts themselves, and unless we have them tolerably complete, we might almost as well be without the collection altogether. It is necessary, therefore, to lay down a far more restricted plan for the one than for the other; and the limits we have proposed to ourselves are: that our museum should be almost entirely confined to the Natural History, the Geology, and the Archæology and Ethnology of Canada. Such a collection we may, in time, hope to carry to some respectable degree of completeness; but it will require considerable self-restraint in our Curator and Council not to enlarge their plan, for there are few more seductive pursuits than that of collecting a museum.

The small volume of the Transactions of the last session has been placed in the hands of the members. We can hardly say that it contains any very brilliant papers, or any great amount of original research; but we may hope that our increasing number of members may afford us better materials, during the present session, for our next volume; and that we may, ere long, regain the position we once bade fair to occupy—a position worthy of this the most ancient city in America, and of the patriotic men who were the founders of the society.

I believe that I have now laid before you all that I need say upon the business of the society during the past year, and of its plans and prospects for the future. I propose devoting the remainder of this address to some general observations upon one of the subjects, for the advancement of which our society was especially constituted.

We often refer with pride to the astonishing progress which has

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been made, during the past half century, in almost all branches of physical investigation, and in those practical applications of them, which have been such a convincing illustration of what so called practical men are apt to ignore—that pure science is the true mother of all useful arts. Geology, chemistry, and electricity in all its numerous modifications, hardly date their recognition as sciences beyond the present century; whilst the marvels of photography, the electric telegraph, and the application of steam to locomotion, both by land and water, have arisen during the lifetime of most of us. Since the invention of printing, and its legitimate consequence, that great upheaval of the human intellect, after centuries of thraldom, which resulted, on the one hand, in the Reformation, and, on the other, in that free spirit of enquiry which placed the physical sciences on their present basis, there never has been an era in the history of man, which has been marked by such vast accessions of knowledge and power. But, whilst we render due homage to those philosophers, whose genius has given us this insight into the constitution of the material world, and this command over its resources, we must not overlook the almost equal progress in those sciences which deal more particularly with man and his place in creation. Political economy, as a systematic science, is not more than seventy or eighty years old; and it is within a still later date that archæology and ethnology have been approached in that philosophical spirit, which has removed them from the regions of wild conjecture, and has entitled them to rank as well established branches of sober investigation. The study of languages, of their affinities, and of the laws which regulate their formation, and their gradual change and corruption, is the growth of the present century; and within the same period we have learned to decipher, with more or less confidence, the hieroglyphics of Egypt, and the cuneiform inscriptions of Assyria, which had remained sealed books for two thousand years. All these branches of investigation have had a powerful influence upon the study of history, and have given us an insight into the position of the human race in the earlier periods, when written records are scarce,

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or fail us altogether. But it is to the progress of history, properly so called, that I wish to direct your attention to-night, and to the revolution which has taken place of late years in the spirit in which this study has been pursued; and in doing so, I wish to point out some of the errors, into which I think that an undue zeal for reform has led us to fall, and the directions in which a succeeding generation will probably think that we have overstepped that philosophical caution, which, on the whole, has undoubtedly characterized the historical investigations of the nineteenth century.

The distinguishing characteristic of the study of history, as now pursued, is the same as that which has marked the progress of the physical sciences. We have learned to form an independent judgment, and to disregard mere authority unless it can be proved to rest upon a solid foundation of ascertained fact; we refuse to accept an incident, or a version of events, because it has been so related by an author of celebrity, without a rigorous examination into the means of accurate information which he possessed, and of the authorities upon which he relied. The only ultimate evidence which is admitted as really valid, is that of a contemporary witness, and not even then, unless it can be shown that he had opportunities of personal observation, or was in a position to have intercourse with those who had; and when, as often happens, such witnesses, competent in other respects, disagree, far greater pains are taken than were formerly thought necessary to sift the matter thoroughly, and to examine the party or national bias which may have influenced each, and all the points that may affect the credit to which they are respectively entitled. Historical evidence, in fact, is treated almost as we would deal with the testimony in a court of justice; excepting that, from the nature of the case, we are obliged to admit of hearsay evidence to a greater extent, provided that the reporter be himself entitled to credit for truth and intelligence, and that his informant had the requisite qualifications.

In the history of more recent times, the change in this respect is not so striking, as when we recede to more remote periods, because the same process had always been followed, though not so

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systematically as now, and because contemporary reporters are more numerous; but there is a far more strict and conscientious examination of the materials, published and unpublished, from which the true version of the facts must be elicited, and many a universally current story, when traced up to its ultimate authority, has been found to rest upon no solid evidence whatever. The modern historian, indeed, has at his command, for the elucidation of the events of the last two or three centuries, materials which were inaccessible to the writers of the period of which he may be treating. The public archives, and the records of private families have been ransacked, and the most interesting documents have been published; whilst the immense masses of documentary evidence which still remain in manuscript, have been classified, catalogued, and rendered accessible to the historical student. Many entirely new veins of information have been opened, as in the case of the archives of Simancas, and state papers relating to the most interesting periods of history have been now brought to light, the dust upon which had never been disturbed since the day when they were first laid in their repositories. It thus happens, paradoxical as it may appear, when you remember the stress laid upon the importance of contemporary evidence, that a historian of the present day can give a truer account of a distant period, say of the reign of Queen Elizabeth, than could any writer who himself lived at that period. He could only tell us what was currently reported in his day, or at most what the chief actors may have been willing to communicate, or may have wished to have believed;—we, besides possessing his account, are in possession of strictly contemporary materials, which were inaccessible to him;—we have been admitted behind the scenes, and have conferred with the chief actors themselves in their most confidential moments;—we know not only what Cecil, or Walsingham, or their mistress, said of current events, but what they really believed, which is by no means always the same thing; and not only that, but sometimes we know that both what they said and what they believed was untrue, because we have the private instructions of some foreign ambassador to deceive them.

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Concurrently with this improvement in the materials from which history is to be constructed, we have had a corresponding change in the outward dress in which it is presented to us, arising, in a great measure, from the altered character of the materials themselves. The great outlines of the events remaining the same, we have accumulated a mass of details, both for explaining and establishing the leading events, and for illustrating the spirit and temper of the times, which, except with this object, would be of no great importance, and would formerly have been considered quite unworthy to find a place in legitimate history. A history of the present day then comes to bear to one of the same epoch, composed a century ago, somewhat the same relation, as does a landscape of the pre-Raphaelite school, which strives to imitate nature by an extreme elaboration of minutiæ, to a grand old picture by Salvator Rosa, which trusts for its effect to bold outlines and large masses of light and shade. The very language has taken a coloring from the substance of which the history is composed. The trivial nature of many of the details and illustrations, which give such a life-like appearance to the whole, has introduced a familiarity of expression, which was formerly only admitted in lighter literature, and forms a striking contrast to the solemn and somewhat ponderous style which was alone thought suitable to the dignity of historical composition. The variety and minuteness of the details call forth the utmost skill of the writer to give the requisite unity to the whole, and all the resources of rhetoric are put in requisition to compound out of the heterogeneous materials a vivid picture of events.

Without entering into the respective merits of the pre-Raphaelite and classical schools, either of painting or writing, I think it will be conceded that our modern historians, as a rule, not only give us a more trustworthy version of the facts, but transport us more completely into the times of which they treat, and make us more thoroughly acquainted with the actors as living men. There are no finer or more life-like specimens of word painting in any literature than some of the eloquent descriptions of Thiers, or

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Macaulay, and that magnificent picture—magnificent in spite of its outrageous mannerism—Carlyle's French Revolution. But this *vraisemblance* is not necessarily a proof of perfect accuracy of facts; and the style exposes to temptations, from which the calm historian of earlier date was exempt. Few painters can resist striking contrasts and brilliant colors, even if they are led by them to overstep the modesty of nature; and we may be permitted to doubt whether our writers have not sometimes forgotten the historian in the artist, and sacrificed sober truth to pictorial effect.

But there have been few truths discovered which have not, during the process, brought forth a large amount of error. With poor fallen human nature, the bane and the antidote are inseparable, and you cannot get the good without some share of the evil. Apart altogether from the occasional exaggerations and perversions, which the fascinations of rhetorical style may lead to, the industrious search after new facts has given rise to an abundant crop of very questionable history. So much of the accounts of former times has had to be re-written, as new materials of undoubted authority have been brought to light, and we have had so frequently to alter our estimate of leading characters, as we have gained more insight into their motives of action, that the old landmarks of history have become unsettled, and each new writer thinks that he may parcel it out afresh, like a *terra incognita*. Few men are without some party or other bias, and there is a natural tendency to make a hero or a scoundrel of everybody to whom you specially devote your attention; so that it is not surprising that a few new facts, perhaps, should have formed the original inducement to commence the work, and that an industrious search should then have been instituted for more, with the express object of taking an entirely new view of events. With a really able and conscientious inquirer, even if he has some preconceived bias, the value of his new illustrations will more than compensate for any exaggeration in his results, and a historian like Froude, in spite of his partisanship, cannot but do good service to the cause of truth. But there have arisen a host of inferior writers, whose special object seems to have been to ex-

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hibit everything in a different light from what had been generally accepted before; and to such an extent has this been carried, that we should feel no great surprise at finding King John painted as a high-minded personage, much maligned by his barons, or Charles the Second represented as a respectable individual, rather in advance of his age in sobriety and decorum. There would be nothing more strange in such a revised estimate of these characters, than in the recent attempt to rehabilitate the memory of Tiberius. Such little eccentricities inflict no great injury; they are soon forgotten, but in the conflict of opinions truth is elicited, and we may feel confidant that, whilst the errors will perish, the truth will endure.

As we ascend the stream of time, contemporary records become more and more scarce, and the received facts of history, if not less questionable, are at least less questioned, from the absence of materials on which a new theory of events may be founded. A long interval occurs, with respect to which, although much learning and research have been brought to bear upon it, there is no great characteristic which marks a treatment of it peculiar to the present age. But when we ascend higher still, and reach to the extreme verge of contemporary registration, a field of speculation lies beyond, in which it has been the special delight of the great historical authorities of Germany to exercise their critical acumen, and not unfrequently to give the reins to their imagination. Conjecture has been reduced to a science, and historical canons have been laid down, by which we may learn what to believe and what to repudiate, and how to detect the substratum of truth which underlies the mass of falsehood. We have no new materials to guide us. All these had been already collected by the learned industry of the two preceding centuries; but, if fresh witnesses cannot be called into court, the present century has furnished us with a host of interpreters to explain their inarticulate utterances, and it must be acknowledged that it would have been more satisfactory if the interpreters had been better able to agree amongst themselves as to the true meaning which they profess to elicit.

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It is not strictly correct to say that we have no new materials, for, besides the partial recovery from palimpsest manuscripts of the works of some ancient authors, as Cicero's Republic, Gaius, and some other fragments, we have the revelations of the hieroglyphics and of the cuneiform inscriptions. Without attempting to pronounce an opinion as to the degree of faith to be attached to the interpretations which are given, I may be permitted to observe, that in both cases we know the language only from its probable resemblance to cognate dialects of later times, and in both we have to discover the character, with a doubt in the case of the hieroglyphics, as to how far it is phonetic writing at all. At first sight it looks almost as hopeless as Pharoah's demand to be told, not only the interpretation of his dream, but the dream itself. I am, however, unwilling to put any bounds to what the ingenuity of man may discover; but I think we may be taught caution in placing undue confidence in the results, from our utter failure to solve an apparently much easier problem. We have numerous inscriptions, some of them of considerable length, in the languages of ancient Italy, and all written in a character with which we are perfectly well acquainted; so that here we have the dream given to us and only require the interpretation. Some are supposed to be in Umbrian and Oscan, and bear a certain analogy to Latin forms; and by the help of a good deal of conjecture, their interpretation has been attended with some success. But the Etruscan inscriptions, though, from the circumstances in which we find them, we know pretty well what they ought to be about, remain absolutely inscrutable. Every known language has been put in requisition; but, with the exception of the proper names, all the researches of modern philology have elicited nothing more, than that the formula RIL AVIL seems to be equivalent to "aged so many years" on a modern tombstone. But they have found interpreters, each as sanguine and confident as the decipherers of the inscriptions of Persepolis or Thebes. Donaldson has read them into Icelandic, Lanzi into a barbarous Greek, and Sir Wm. Betham into classical Irish. But as Sir William construes into

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the same ancient tongue the Eugubine tables also, which are clearly in a different language, and makes them all relate to the same thing, viz.: the proper course to steer in order to reach Ireland, I should have very little faith indeed in his theory, even if I could suppose it possible that anybody would be at the pains to engrave on tablets of brass such utter nonsense as his version.

I do not wish it to be understood that I look upon the interpretations of Rawlinson or Lepsius as on the same footing with those of Sir Wm. Betham or Lanzi. They belong to an entirely different school of philology, and there appears to be a high degree of probability that we have unlocked the secrets of the cuneiform inscriptions, and to a less extent those of the hieroglyphics; but it is only a probability after all, and much doubt rests upon many important renderings. This should never be lost sight of, when the conclusions drawn from them are made the foundation for corrections of history derived from other sources.

But to return to the modern treatment of ancient history, with which the deciphering of inscriptions has been connected only to a limited extent. No one can more highly appreciate than I do, the untiring research and the varied learning of these reformers of history, and the sagacity with which they have pursued their system of investigation. They have created an entire revolution in our method of dealing with the records of these early times, and in our appreciation of the truth of the accounts which have come down to us, and they have thrown great light upon portions of history which were formerly imperfectly understood. But if they have done much good, it has not been without a counterbalancing alloy of evil. When the mind first emancipates itself from a blind subservience to authority, its efforts to exert its freedom almost always run into exaggeration. The strong conviction, that ancient history rested upon no certain basis of external proof, induced a scepticism, which has probably been carried much too far, and has not sufficiently drawn the line between the uncertain and the untrue; and, on the other hand, the attempt to form a

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judgment from an independent examination of the internal evidence alone, has led the critics to an over-confidence in their own discernment, and, as may be observed in other forms of scepticism, one idol has been pulled down only to erect another in its place. They have destroyed the foundations of the ancient structure, which, if it was deficient in exact truth, had exercised a real influence in the formation of the characters and opinions of succeeding generations; but their attempts at reconstruction have generally resulted in a fabric as baseless as that which they destroyed.

Until quite recently, an author who undertook to write a history of any ancient period, related the events as they have been transmitted to us, with few indications of his own belief in the greater or less amount of truth with which the several incidents had been handed down, and with no systematic attempt to analyse the evidence, upon which we were called upon to receive them. In the earliest times it would be admitted that we knew but very little, but that little was looked upon, or at least related, as if it were as authentic as our fuller information with respect to later periods. If the earliest accounts differed, some small amount of discrimination became necessary, and greater authority, perhaps, would be attached to one ancient author than to another, both of whom probably lived many centuries after the events which they record. When we came to events of a supernatural or mythical character, a rational explanation of them would be given, a method already largely employed by Thucydides and other ancient authors, and nothing would be discarded which was not grossly inconsistent with historical verisimilitude. This was generally the utmost amount of criticism which was expended upon the subject, and such are the sources from which nine-tenths of the present generation have formed their ideas of ancient history.

The new school pursued a very different course. They closely examined the evidence which has descended to us, with a view of ascertaining how much of it rested upon anything which, even on the most liberal construction, could be regarded as contemporary authority. It was not enough that Livy or Herodotus had so told

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the story of an occurrence some centuries before their time, but it was necessary to enquire whence they could have learned the facts, and how near to the period in question the certainty, or even the probability, of authentic records could be traced. As judged by this test, a very large portion of the ordinarily received accounts disappeared altogether from the field of authentic history; and however much we might regret to have our faith in the beautiful legends shaken, no one could doubt the advantage of defining what might be looked upon as a true record, and what was based only on uncertain tradition. But as in a court of justice, when ocular testimony cannot be obtained, we admit of circumstantial evidence, or a legitimate inference from previously established facts, so in history mere oral tradition may be accompanied by corroborative proofs, which may entitle it to almost as much credit as is attached to a written contemporary record. Thus two or more independent traditions may concur upon some point common to the two, and may support each other; a state of society within the time of authentic history, may point to a cause in which it must have originated, confirmatory of the traditions; or local customs, monumental remains, and even names of places, and the etymological history of particular words in the language, may afford indications of events, of which we have otherwise no certain proof. Such isolated facts are like the fossils in an ancient stratum, from which a geologist may infer the conditions of life in the remote period when they were deposited. It is evident that researches of this kind involve the necessity for inexhaustible stores of varied learning, and great critical acumen, and that when these are brought to bear under the guidance of an unbiassed judgment, the results obtained may be looked upon with almost as much confidence as we repose in facts externally better authenticated. It is in such investigations as these that the great achievements of the German critics have been obtained; but it is also evident that we are now verging upon delicate ground, and that there is no well defined limit between legitimate inference and unsupported conjecture. A fertile imagination is a necessary qualification for any one who would build up a

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new science. Unless he be content to tread in the same dull round as his predecessors, he must have the creative faculty in full force; but unless it is tempered and held in check by a sound judgment and an earnest love of truth, he may very easily overstep the limits of sound inductive reasoning. Our critics have been so successful in many of their conclusions, that they have learned to put the most implicit faith in them, and in their methods of interpretation. From the comparison of a number of circumstances, each of which in itself would not constitute a satisfactory proof, they draw an inference possessing a high degree of probability; and then, assuming this as a fact, they deduce from it further inferences which are stated with equal confidence—forgetting that with each succeeding deduction the amount of the original probability is constantly diminishing (1). The result is frequently given to the world without a hint as to the dubious process by which it is arrived at, and the general reader would be apt to take the statements for perfectly authenticated facts, were it not for the entirely opposite conclusions which different authors often draw from the same premises.

The subject is an important one in itself, and it has obtained, at the present moment, a further interest from the discussions, which are engaging the public attention, upon the authenticity and credibility of other records, to which the same canons of criticism have been applied, as were first introduced by the modern German school into the study of ancient secular history. I may

(1) In the opening chapter of the second volume of his history, Niebuhr distinctly asserts the validity of this method of reasoning. "If," says he, "we discover the delusive medium by which objects are distorted before the eyes of the acute historian, and can guess what the simple compiler must have heard of, these enigmas turn into valid evidence, *and so form grounds for other results*," page 13. But the danger of relying upon such a process admits of a very simple arithmetical illustration. If we assume a critic's sagacity to be such that it is ten to one that he will draw a true conclusion from established facts—when he reasons from this conclusion as from a fact, and draws a second inference from it, the chances of the latter being true are only five to one: and if he repeats the operation again, they are reduced to three to one. If the original probability in his favor is less, say two to one, at the second inference the probability is already slightly against him, and the chances are about five to two that a third inference is *false*.

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therefore, perhaps, be excused if I enter into some detail in illustration of it.

Foremost amongst the critical historians of our time stands Niebuhr, both as being the first to bring the new doctrines prominently into notice, and from the mingled boldness and sagacity of his criticisms. He has indeed been equalled in learning, and surpassed in discretion, by some of his followers; and his authority, which perhaps never ranked so high in Germany as it did in England, has been, in a great measure, superseded by later and more judicious commentators. There has even been a reaction since the freedom of his speculations first arrested the attention of Europe, which may sometimes have run into the opposite extreme; but his method of dealing with the system he taught, may be taken as the type—the exaggerated type, perhaps—of its strength and of its weakness, and the new school of history will always be inseparably connected with the name of Barthold George Niebuhr. Subsequent researches may indeed have been followed out with more caution, and their results may have been enunciated with less dogmatism, but the main principles of the school remain the same, viz.: by a strict examination of the internal evidence, and by the application of certain critical canons and rules of evidence, to pronounce upon the authenticity of the narrative under consideration; to discriminate between that which is genuine, and that which has been interpolated; and to offer the reconstructed fabric as a true exposition of the events of the period. For this reason, and because he is better known amongst us, and has had more influence in forming our own historical literature than any of his successors, I shall principally confine myself, in the following observations, to an examination into Niebuhr's mode of treating ancient history. As Roman history was the principal field of his labors, in order to appreciate them properly, we must understand what are the evidences upon which the early history of Rome is based.

The earliest histories we possess are those of Livy and Dionysius, who wrote in the time of Augustus, about 750 years after the date assigned to the building of the city. We have also extant

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many fragmentary notices and allusions to the earlier events, few of which are of much older date. It is evident that these in themselves would be quite worthless as authorities for occurrences so long anterior to their own time; and it is to be observed, that there is hardly an event mentioned of which we have not two or more wholly irreconcileable accounts. Such authorities can only be trusted in so far as they repeat what was related by other writers before their time, but who are lost to us. Now they tell us, that the earliest histories, of which they knew anything, were those of Fabius and Cincius, who lived a little more than two centuries before them; and that all such imperfect records as there might have been before that time, perished at the sacking of this city by the Gauls, about 160 years earlier still. Greece had a literature of much older date, but the earliest known references in it to the history of Rome extend to no earlier period. They are preserved to us by Plutarch, viz.: Hellanicus of Pontus, who lived at the time, said that a certain Hellenic city called Rome, somewhere near the Great Sea, had been taken by the Hyperboreans; and Aristotle, some fifty years later, added to the account, that it was recovered by a certain Lucius—Camillus's real name, be it observed, having been Marcus. It is much as if our entire knowledge of English history, from the invasion of Julius Cæsar downwards, were derived from some writers about the conclusion of the wars of the Roses, who told us that the earliest accounts which they had seen were those of two chroniclers in the reign of Edward I., and that they related that all written record of earlier times had been destroyed by William the Conqueror. If we further suppose that we had found an allusion to the conquest in an old Italian author, who said that a certain man named Robert had invaded an island in the North Sea, we shall have a very fair representation of the direct sources of early Roman history. But the events of the earlier years are related to us with the greatest minuteness of detail, and almost all those beautiful legends which are so inseparably connected with Rome, belong to the period anterior to the capture of the city, which must be taken as the starting point of anything like contemporary registration.

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Such are the materials which Niebuhr undertook to work upon, to extract from them whatever of truth they might contain, and, to use his own words, "to bring into order the chaos of the early times of Rome (2)." It was not enough with him to shew how insufficient, and how contradictory our evidence was. This had been done before his time by Beaufort and others, and has been carried out with much more minuteness in our own by Sir Cornewall Lewis. He was not content to be a mere architect of ruin. It was his aim to restore, and his boast that he had reconstructed a clear and intelligible history, which we might thoroughly rely upon (3). He certainly lacked no faith in his own conclusions, and I doubt if any writer, who records what he himself had witnessed, uses so freely the words "certainly," "undoubtedly," and "without any question," as does Niebuhr with regard to versions of the story which rest only on his own conjecture. He considers that the extant histories are not themselves authentic, but that they contain the true events which it is his business to discover (4), and in doing this he claims for himself, almost undisguisedly, a kind of power of historical divination, or second sight (5). In his lectures on ancient history, he tells his pupils that a familiarity with the method of laying open what is hidden, soon leads to this confidence; and in laying down some of his axioms of historical criticism, he admits that the use of them cannot be taught, as they require a peculiar tact (6). There is no doubt that the habit of such researches, and certain mental characteristics, will give an aptitude to some men, which others can never master; and that they

> "Through old experience, may attain
> To something of prophetic strain."

But if the process cannot be taught or explained, its results, in

(2) Hist. III., p. 159.
(3) Hist. II., pref. vi., and p. 1.
(4) Lect. Anc. Hist. I., p. 233 (lect. xxi); Hist. II., p. 12.
(5) Hist. I., p. 152, II., p. 14; III., p. 318, 321.
(6) Lect. Anc. Hist. I., p. 228 (lect. xx.); p. 234 (lect. xxi.).

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order to inspire much confidence, must be capable of subsequent verification, which unfortunately, in historical enquiries, is not the case; and in the absence of such proof, we may be excused if we do not place implicit trust in a heaven-born faculty, like that imparted by Minerva to Diomede, of distinguishing gods from men.

It is quite probable that many events were preserved by traditions of the leading families; and it is possible that some of them may have been reduced to writing in the early times, though there is nothing in any ancient writer to countenance it. We know also that it was the custom to deliver funeral orations over the deceased, reciting their great actions, and some of these *may* have been written out, though the earliest of which there is any mention do not date prior to the second Punic war. But Niebuhr assumes the existence of both of these, as sources of the current history. He has no hesitation in pointing out what parts of each story were derived from them, even with regard to events long before the sacking of Rome by the Gauls, and he discriminates between the trustworthiness of those of different families. He considers the family traditions of the Servilii "worthy of full faith;" and those of the Fabii as "containing matter of undeniable authenticity;" but he thinks those of the Valerii deserving of less credit, and those of the Furii to be shameful falsifications (7).

So also we know that there were certain official registrations, some of which may have been preserved in the Temples of the Capitol from before the time of the burning of the city. As far as we can judge of their contents from the accounts we have received, they seem to have consisted of the most meagre lists of magistrates, and formal records of prodigies, and other matters connected with their religious observances. They do not seem to have borne any resemblance to detailed history, though, as far as they were preserved, they would form a most valuable foundation for the determination of dates. Yet upon no further evidence Niebuhr has assumed the existence of regular annals, and in spite of the direct assertion of Dionysius, that Fabius and Cincius were

(7) Hist. II., p. 3-5.

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the first historical writers, and of the almost as precise testimony of Cicero and Livy, he maintains that "a variety of popular books must have grown up," "must have spread very widely," and must have become "great favorites" at an earlier date (8). Having thus inferred the existence of these annals by his own peculiar method of reasoning, he constantly refers to them with as much confidence, as if they lay open before him, as authority for certain events, while other circumstances are attributed to poems and funeral orations (9). He even distinguishes between faithful and less trustworthy annalists, and in some instances he quotes the very words which he supposes the hypothetical annalist to have used, and maintains that subsequent historians have misunderstood the meaning of the passage (10).

So it is also with what he supposes to have been the other great source of Roman history, the poems. We have the authority of Cato, the elder, for the fact, that it was the custom at banquets to sing poems on the great feats of celebrated men; but no poem on a historical subject appears to have been known to the ancients, anterior to that of Nævius, about the time of the second Punic war, and we have the express testimony of Cicero that none of the poems alluded to by Cato were extant. This is the whole foundation upon which Niebuhr has built his superstructure of an immense mass of legendary poetry, a fact not in itself improbable, but unsupported by any ancient authority. Having thus created the poems, Niebuhr furnishes a detailed scheme of their subjects. The reigns of Romulus and Tullus Hostilius were each the subject of a continuous epic, while of the reign of Numa there were only detached lays. Then we have the lay of the Tarquins, the

(8) Hist. II., p. 7.

(9) Hist. II., p. 41, 104, 198, 249, 255, 263, 264; III., p. 117, &c.

(10) Livy altered the formula, Lect. R., Hist. I., p. 42 (lect. iv.); Livy misunderstood *classis*, *ibid.*, p. 88 (lect. viii.); Cicero *minor natu*, *ibid.*, p. 108 (lect. x.); Livy *minores*, Hist. I., p. 328, and II., p. 114; Livy *populus*, Hist. I., p. 530; Livy quotes without understanding, Lect. R., Hist. I., p. 121 (lect. xiii.); Livy and Dionysius did not comprehend the expressions they preserved, *ibid.*, p. 83 (lect. vii.); Festus did not understand the author he abridged, *ibid.*, p. 45 (lect. iv.); persons have handed down statements without understanding them, Hist. II., p. 13.

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lay of Coriolanus, &c., &c. With two such sources of history as the poems and the annals at his command, Niebuhr has no difficulty in accounting for all inconsistencies, and in pointing out what event was interpolated from the poems, and what had been narrated in the genuine annals (11). Nay, in his account of the battle at the lake Regillus, which closes the lay of the Tarquins, he undertakes to restore the true form of the lay itself, which had been distorted by the historians who borrowed from it. In his history he maintains that in the lay, Tarquinius himself must have been killed, though the historians represent him as escaping with a wound, and that "most unquestionably" Spurius Larcius must have fallen there also in the poem, though he is not mentioned. In his lectures in later life, he repeats the conjecture in these words, which form a good example of his way of speaking with absolute certainty of things entirely unknown: "The legend undoubtedly related that Tarquinius and his sons were likewise slain, and the statement that the king was only wounded arose from the record in the annals that he died at Cuma. The introduction of the dictator Postumius was certainly a pure interpolation, and the poem undoubtedly mentioned Sp. Lartius, who could not be wanting there any more than M. Valerius. * * * * This battle forms the close of the lay of the Tarquins, as the lay of the Nibelungen ends with the death of all the heroes. I am as strongly convinced of this now, as I was eighteen years ago" (12).

But it was not always that Niebuhr could look back with undiminished confidence to his earlier conjectures. In the first edition of his history he repudiated the idea of an Alban colony, and contrary to antiquity, maintained the Etruscan origin of Rome. Before his second edition, however, he saw reason to change his opinion, and he then expresses a pretty strong conviction that Tarquin himself, whom all authorities make an Etruscan, was really

(11) Hist. II., p. 475, 484, &c.; Lect. R., Hist. I., p. 112 (lect. xi.); p. 115 (lect. xii.); p. 245 (lect. xxix.), &c.

(12) Hist. I., p. 558; Lect. R., Hist. I., p. 124 (lect. xiii.). So also he speaks of restoring the original Lay of Camillus, Hist. II., p. 475, and he says that the Lay of Cincinnatus may be restored "with indubitable certainty," Hist. II., p. 264.

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a Latin. But in the passage in which he makes his recantation, there is more diffidence exhibited than can usually be found in his writings, and he admits, that in attacking error, men naturally run into exaggeration. He even pronounces the judgment, "If any pretend that he is able to decide in questions of such obscurity, let none listen to him" (13). But as time advances, his confidence is restored, and in his lectures he asserts that it is "historically certain" that Tarquinius was a Latin, and he thus corrects the errors of antiquity (14). "The Romans described Servius Tullius, who was an Etruscan, as a Latin of Corniculum, and made Lucius Tarquinius Priscus, who was a Latin, an Etruscan." But a couple of years later, in another part of his lectures (15), he gives very good reasons for considering Servius to have been a Latin after all, as the Romans had always made him. The whole subject reads rather confusedly in Schmitz's edition, where the lectures, as given in different years, are amalgamated together; but this appears to be the course of Niebuhr's change of opinion,—and the reason for the change is sufficiently characteristic. The grounds for making Servius an Etruscan were a fragment of a speech of the Emperor Claudius, preserved in an inscription at Lyons, in which he says that the Etruscan records made him a man of that nation, whose original name was Mastarna; and Niebuhr maintains that "the most credulous adherents to what commonly passes for a history of the early ages of Rome, could not decline the challenge to abide by the decision of Etruscan histories" (16). But, in the meantime, a few fragments of two Etruscan historians were discovered in some palimpsest scholia on Virgil, which, in Niebuhr's opinion, "immensely reduce the estimate of the value of Etruscan books for the early times." (17) "It appears," says he, "that just as the Romans misunderstood the ancient Latin history, and substituted the

(13) Hist. I., p. 387.
(14) Lect. R., Hist. I., p. 52 (lect. v.).
(15) *Ibid.*, p. 99 (lect. ix.).
(16) Hist. I., p. 381.
(17) Lect. R., Hist. I., p. 100 (lect. ix.).

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Tyrrhenian in its place, so the Etruscans adopted the traditions of the Tyrrhenians, whom they subdued, and represented Tarchon as the founder of their empire from Tarquinii." In other words, their account directly contradicts Niebuhr's unsupported theory, that the Tyrrhenians and Etruscans were not one and the same nation, as all antiquity had made them.

In contrast to this final conclusion of Niebuhr, which recognizes no Etruscan element in Rome at all, it may be interesting to see what the view of another great authority is, with regard to the reigns of the three last kings. Müller does not, indeed, admit any of them to be real personages, but he supposes them to represent the ascendency of certain Etruscan cities. Thus the two Tarquins shadow forth the pre-eminent influence of Tarquinii, and the intermediate reign of Servius, that of the rival city of Volsinii, secured by the invasion of Mastarna; while the expulsion of the Tarquins is supposed to be effected by Porsena, who established the ascendency of Clusium. These accounts evidently differ from each other even more than they both depart from anything which the Romans themselves believed of their early history.

Niebuhr's treatment of the story of Coriolanus is a very good specimen of his method. He does not deny the existence of Coriolanus, or that he was banished in consequence of his attempt to abolish the Tribunate. He does not deny that the Senate had corn (respecting which the quarrel originated), but he disputes its having come from Sicily. He believes that he took refuge with the Volscians, but that he went to Attius Tullus of Antium, the particular Volscian leader mentioned in history, he considers apocryphal; and that he was commander of a Volscian army he looks upon as pure fabrication. He places the whole story at a much later date, but what is evidently his favorite emendation is his discovery of the true meaning of the female embassy, which induced Coriolanus to remove his army. He supposes him to have been at the head of a band of Roman exiles, of whom no mention is made in the history as it has come down to us, and to have been

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supported by a Volscian army. "The Republic," he says, "invited him to return, and the entreaties of his mother and wife can have had no other meaning than that he should return alone, and not bring with him that terrible band" (18). In another place he says, "These, his companions in misfortune, Coriolanus demanded should be recalled as well as himself: this is as indubitably certain as if every historian attested it" (19). The whole story, as related to us, is certainly full of many inconsistencies and improbabilities, and it has doubtless been a good deal embellished by tradition; but if we are called upon altogether to deny the authenticity of the account we have, and to reconstruct it from pure imagination, I confess that I prefer the poetical falsifications to the critical ones.

The most important researches of Niebuhr are those connected with the constitutional history of the early republic. The character of the constitutional changes which may have occurred, rests upon a somewhat different foundation, as to evidence, from most historical events. The latter are generally isolated facts, and if they have been misrepresented, we have no means of recovering the true account. But a change in the institutions of a country leaves its traces through many succeeding generations; and in a nation which laid so much stress upon constitutional precedents as did the Romans, tradition would probably not depart very far from the truth, as long as the institution itself retained its existence. The accounts, however, as handed down to us, are often not very intelligible, and Niebuhr has done better service in this department of his researches, than in any other. Yet even here his habitual self-confidence leads him to maintain with certainty theories which, however plausible they may be, and however generally they may have been adopted from him, rest, really, only upon conjecture. The most noticeable of these is the meaning he assigns to the word *populus*, as implying the patrician order only, a meaning in which it was never understood by any writer, ancient or modern,

(18) Lect. R., Hist. I., p. 190 (lect. xxiii.).

(19) Hist. II., p. 240.

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until he discovered it. As many of our authorities, including Fabius, the earliest known even to Livy, wrote in Greek, Niebuhr suggests that the lack of a precisely equivalent term led to its being translated δῆμος, and to its being thought to include the whole people; and he maintains that in the later ages of the republic, the old constitutional forms had become obsolete, and the true meaning of the terms forgotten. It certainly would be strange if the Romans of Cicero's day had entirely misapprehended the meaning of the word *populus*, involving as it does the political significance of the *comitia curiata*, and the whole constitutional system of the early days of the republic, and that it should have been reserved for a German of the nineteenth century to discover it, and that too from their own words, which they had failed to understand themselves. The interpretation of the hieroglyphics even would seem a less wonderful achievement. Yet this is what Niebuhr confidently asserts that he has done. He admits that Livy or Cicero did not understand the word as he does, when they used it; but that in speaking of the early history, before the *curiæ* had degenerated into a mere ceremonial form, they copied the words of some old annalist who did understand what he meant, and that from these quotations he, Niebuhr, is able to deduce the correct view of these hypothetical annalists. (20) This proposition is distinctly stated, over and over again, in many passages of his history, and his lectures; but it evidently rests upon three perfectly gratuitous assumptions: 1st, that the authors who have come down to us quoted the exact words of the older authors, which they nowhere profess to do; 2nd, that they misunderstood the words they quoted, although, besides other sources of information which we do not possess, they had the context of the passages to guide them, which we have not; and 3rd, that there were any old authors to quote, who did not themselves live three or four centuries after the times of which they are speaking.

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(20) Hist. I., p. 412; 427, note; 608 note—in which latter passage he says he re-translates Dionysius into what he had read in the authentic notices. See also instances referred to in note 10.

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I must apologize for the length to which these remarks have extended, but it was impossible to give any just idea of the characteristics of the modern German school of criticism, without exhibiting them in a few instances, and these could not be made intelligible to a general audience, without entering into some detail. Neither should I have felt myself justified in expressing a doubt as to the trustworthiness of the history as reconstructed by so great a man as Niebuhr, without giving a full explanation of what I look upon as the weak points of his method, with a reference to particular instances in illustration of them.

You may very fairly ask—if the received history of these early times is shewn to rest on no authentic evidence, and if the revised accounts, which have attained currency of late years, are based upon still less—what are we to believe? We appear like the poor dove after the deluge, which wandered over the world of waters without finding a solitary point where a firm footing could be obtained, and returned from its search with the intelligence that all was void.—I do not think that our position is quite so hopeless; and I have a good deal of faith in the general truth of early history, and more especially of early Roman history.

Admitting to the fullest extent our deficiency in contemporary records, and entertaining great doubts as to the existence of those other written sources of history, upon which Niebuhr has founded many of his arguments, I think that the power of oral tradition to transmit a substantially correct statement of facts, is very much underrated. We are apt to look upon the subject, from a modern point of view, when all important events and all opinions of men of intelligence are committed to writing, and oral tradition is left altogether in the hands of the illiterate. When writing was little practiced, and writing materials were scarce and difficult to use, much more reliance must have been placed on the memory, and the recording in it the great deeds of men, and the events in which they took a part, must probably have become a sort of profession, as with the λογιοι of Greece, and in other nations. We can hardly understand the extent and accuracy to which the exercise

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of a trained memory can be carried. An instance of this is afforded to us, at the present day, in India. The existing manuscripts of the Vedas are all of very modern date, but the books themselves are universally allowed to be of great antiquity, some of them reaching probably to one thousand years before the birth of Christ. Of this high antiquity there are many independent proofs; but the whole of this literature has been carried down by oral tradition, if not alone, yet concurrently with written records of it. At the present day, we are told that what we may call candidates for orders commit the whole of the Rig Veda to memory, not from manuscripts, but from the oral teaching of a Guru, and that in this training they spend all their youth, from the eighth to the thirtieth year; and a Chinese traveller, whose work is referred to the seventh century, gives exactly the same account of what they did in his time. The result is said to be, that if you take down in writing a hymn of the Rig Veda from the mouths of two Brahmins in distant parts of India, neither of whom ever saw a manuscript, you will not find a word of difference in the two versions.

But at Rome, for the first three or four centuries, all the great offices of state seem to have been held, with very few exceptions, by a very limited number of leading families, and it is natural to suppose that this would facilitate the transmission of such traditions, at least, as principally affected their respective ancestors. And if family vanity did, as is not at all improbable, unduly magnify the achievements of some Valerius, or Furius or Fabius, the concurrent traditions of the rival houses would keep them in check, as far as related to the main events which concerned the Republic at large. We have here a very probable explanation of the numerous discrepancies of the details which have come down to us, with a great general correspondence as to all important events. Moreover, there was from very early times, how early is it impossible to say, a system of official registration, very meagre no doubt, and very imperfect, as the discrepancies in the lists of consuls as related to us show, but still it was a written record; and there were besides, monuments, inscriptions, treaties, and

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other written documents of great antiquity known to the ancients, some of which have even descended to our own time. Now, several independent concurrent traditions, with a thread, however meagre, of recorded fact, appear to me to form no contemptible foundation for a substantially genuine history.

Then we have the constitutional forms, the state of society, and the political position of Rome in Italy at the time when undoubtedly authentic history commences, which is fixed by Sir Cornewall Lewis at the time of the war with Pyrrhus; and almost all the leading events of the earlier times point to, and something not very dissimilar must necessarily have been the precursor of, the state of affairs we find actually existing. This does not indeed vouch for the details, but it does afford a proof of the substantial truth of the traditional account of the leading events, unless we carry our scepticism so far as to suppose them to be arbitrarily forged to account for the acknowledged facts.

In this respect the Roman traditions present a marked contrast to many of the early Greek myths, which have no bearing on the better ascertained portions of the history; and still more so to those legends which have obtained currency in later times, and which have sometimes been produced as illustrations of pure falsehoods, becoming recognised in their day as worthy of universal belief. Brut the Trojan and his mythical successors, although a man like Milton did not think it safe altogether to reject them, connect themselves in no way with any acknowledged fact in English history, or with any possible ethnological theory. There may have been a Welsh prince called Arthur, and an Irish king named Dathy, but what is related of them is inconsistent, not only with the authentic history of other nations, but with the state of society in their own country when we first obtain true indications of it. So also, although Turpin's romance was admitted to be a genuine history in the middle ages, and is even said to have been declared to be such by Pope Calixtus II., yet the feats of Charlemagne and his Paladins could be shewn to be inconsistent with the state of Europe in the following century, even though we had not

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the true account of his reign by his own secretary. But it is very different with the early traditions of Rome. Almost every story is so inseparably interwoven with its constitutional history, and its gradual preëminence amongst the nations of Italy, that if we are to suppose them arbitrary inventions, it would imply an artistic skill in the fabricator, which no forger of any other age or nation has been able to approach to.

If, in the absence of external attestation, we look to the internal evidence of the history itself, we are treading upon dangerous ground. If I were to point out any conclusion to which that internal evidence seems most clearly to lead, it would be to the presumption of the composite origin of the received history—a union of several independent oral traditions, with a core of authenticated facts. We have the greatest precision upon dry and utterly unimportant details, which may be taken from an authentic register, with the poetical amplifications, and the vagueness and incoherence of the events characteristic of traditional legends, and the constantly recurring discrepancies in the details which point to several independent traditions. We hear of a fall of meteoric stones, of a severe winter when the Tiber was frozen over, and of a wolf which was killed in the Forum; but we have the most misty information as to the varying political relations which Rome had with the neighboring Latin cities. We know almost to a certainty the day of the month on which the city was captured by the Gauls, but whether they were bought off by a ransom, or retired of their own accord with their plunder, or were utterly routed and destroyed by Camillus, he would be a bold man who would determine.

In dealing with internal evidence, the critics appear to me to have often thrown an undue amount of doubt upon the credibility of the history. The numerous and irreconcileable discrepancies in the narrations certainly shew that several different versions prevailed, and we can only, by conjecture, affirm one to have greater probability, or greater coherence than the other; but the existence of these very discrepancies, upon some points, is an argument in favor of the correctness of those, upon which all agree. Sir Corne-

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wall Lewis, who carries his scepticism to the highest degree, seems to doubt the whole of a story because the details were differently related; whilst Niebuhr will seize upon a fact from one version as indubitably historical, and from it build up a result differing from everything that has been handed down to us. But modern history is not without irreconcilable versions of the same event. If we can suppose any portion of history, say the wars of Napoleon, to be as destitute of direct evidence as the history of Rome, and that our only knowledge of them was derived from three historians, Thiers, Alison, and Sir Walter Scott, and if we were to judge each event by a rigorous comparison of the three accounts, I doubt whether it would stand the test much better than many parts of Roman history. A critic of one turn of mind might pronounce the whole a fiction, and another might construct out of it a scheme of events entirely inconsistent with any of them.

Niebuhr is particularly severe upon the military achievements of the Romans, and accuses them of magnifying, or entirely fabricating victories, and of concealing defeats, or, if they have to be acknowledged, of always following them up by a compensating victory. Now, although there is a tendency in this direction with all nations in relating their wars, and the Romans, no doubt, were not entirely exempt from it, yet their historians very candidly acknowledge the disaster of Cremera, the defeat at the Allia, the surrender of Caudium, and other minor reverses; and it must be admitted that, as Rome was almost constantly at war, and had risen from a petty state to be the greatest military power in Italy, when we first see her by the light of contemporary history, she must have gained victories, and must have recovered from defeats.

There is one peculiar kind of internal evidence which is very abundant in Roman history, and which I have before alluded to, and compared to the fossils in a geological stratum,—such are monuments, or temples, said to be erected to commemorate certain events, particular customs and ceremonies maintained till later times, and the names of places in Rome, which are said to have had a similar origin. These relics of a former age are exceedingly nu-

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merous, and meet us at every step in the histories. Now, at first sight, they appear to be valuable evidence as to the events commemorated, but it is also possible that the legend was invented to account for the names, instances of which are to be found in modern times, and we often have two or three different stories of the origin. But Sir Cornewall Lewis almost invariably adopts the interpretation subversive of the history. (21) The very fact that there was a monument, or custom, or a name, said to have had its origin in a certain event, is sufficient with him to stamp the event as a fabrication, a legend devised to account for the existence of the monument or the custom. Almost the only instance which I remember, of a contrary conclusion, is the fact, that when the public contracts were given out, the first contract was always for the food of the sacred geese of Juno, which seems to be admitted as a corroboration of the story of the geese saving the capitol. This appears to me to be a very unphilosophical proceeding, and that in most cases the presumption lies the other way. The name or the custom must have had an origin, and unless some good reason to the contrary can be assigned, the generally accepted origin is the most probable; and the currency of the supposed derivation is at any rate a proof that the event itself was the subject of general belief. In the hands of Niebuhr, such facts, as might be expected, become a a two-edged sword,—they are a proof of the event, or an ætiological legend worthy of no credit, just as the course of his argument may require.

The poetical character, and the greater or less probability of an event, are in themselves no sufficient criteria as to its reality; but these features are very strongly insisted upon in deciding what we may accept as genuine in the narratives under consideration. The rapid extension of Mahomedanism, the romantic incidents of the Crusades, and the championship of Joan of Arc, are in themselves highly improbable, but they are, nevertheless, undoubted facts. The suddenness with which the French Directory, and the restored monarchy of the Bourbons melted away on the appearance

(21) Lewis. Cred. Rom. Hist., II., p. 10, 20, 34, 37, &c.

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of a single man, not flushed with victory, but reappearing after disasters, is, to the full, as astonishing as that the character of the war with the Volscians should be entirely changed by the transference of Coriolanus from the one side to the other. There is nothing in the whole series of the Roman wars, as related to us, which is so marvellous as the suppression of the Indian mutiny.—One can imagine how a critic could point out the exceeding improbability of a mere handful of men, scattered over a vast empire, recovering their ascendency amidst a hostile population, and against overwhelming numbers as well armed and disciplined as themselves, and reducing the stronghold of the rebellion before any reinforcements could reach them from without; and how utterly impossible it would appear that this should mainly be effected through the loyalty of the Sikhs, who, a few years before, were our most determined enemies, and who had only just been pacified after a dangerous revolt. We find even minor incidents which are held to stamp a fabulous character upon the ancient narratives, curiously reproduced in modern days. The throwing of loaves of bread into the enemy's camp from the besieged capitol, has its parallel in the siege of Haarlem, where the same thing was done,—not with a view of deceiving the enemy into a belief that plenty reigned within, but in the bitter mockery of despair at the exhaustion of all their resources. So also the feat of Horatius Cocles, whom Niebuhr regards as only a symbolical representatives of one of the tribes in a poem, is almost exactly repeated in the same Dutch wars. John Haring, of Horn, alone held a narrow part of the dyke, between the Diemer Lake and the Y, against the whole Spanish force, until his compatriots had effected their retreat over the gap, and then, like Cocles, he plunged into the water and escaped uninjured. Even the supernatural appearance of the Dioscuroi at the battle of Lake Regillus does not prove that battle to be, as Niebuhr maintains, a poetical invention, for something similar has been reported of several battles in purely historic times. Even as late as the sixteenth century, St. James, of Compostella, mounted on a white horse, appeared at the head of the Spanish forces at the battle of

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Otumba, and led them on to victory. I say that he appeared, because we have the undoubted authority for it of Bernal Diaz, who was in the battle himself. It is true that Diaz says that it did not appear to him to be St. James, but rather one Francisco da Morla, with whom he was well acquainted; but then he adds, that it probably was St. James himself after all, only that he, miserable sinner that he was, was not thought worthy to recognize the saintly presence. We may probably put more faith in Diaz's first impression than in his subsequent conviction, but it would never enter into our thoughts to doubt the reality of the battle, on account of the reported supernatural incident.

For these and similar reasons, I am inclined to the belief that the general credibility of early Roman history has been considerably underrated; but with the utmost latitude of evidence which can be permitted, it must still be acknowledged that there is very little of it indeed, upon which we can look with any certain confidence in the accuracy of the details. If we merely preserved that which we could shew to rest upon a satisfactory basis of proof, we should have nothing left but a nerveless and lifeless skeleton of no practical utility, and of no æsthetic value. Even with regard to the capture of Rome by the Gauls, the first event for which we have any contemporary evidence at all, all of proved fact that Sir Cornewall Lewis has been able to extract may be briefly summed up thus,—That on the 16th of July, in some year between the three hundred and eighty-seventh and three hundred and ninetieth before Christ, a battle was fought and lost about ten miles from Rome on the Allia, a stream which no subsequent topographer has been able to identify; that the city was captured and the capitol besieged; that the geese did give the alarm on the occasion of a midnight assault; and that the Vestal virgins, whilst making their escape over the Sublician bridge, were picked up in the wagon of a man named Albinius (22).

If, on the other hand, we follow the German critics, and endeavor to re-construct a perfect history, we involve ourselves in an ocean of doubt and uncertainty. With such a maxim as that laid

(22) Lewis. Cred. Rom. Hist., II., p. 355.

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down by Niebuhr, "that the inversion of a story into its opposite is a characteristic of legendary history;" (23) so that a statement directly militating against a hypothesis, may become a testimony in its favor; with ætiological legends which may be made at will to prove or disprove an event, and with an etymological alchemy which can recognise in "*Danai*" only another form of "*Latini*" (24), it is evident that anything can be destroyed, or anything established. Whatever be the learning expended in the investigation, the whole system resolves itself into conjecture; and as no two men will take the same view, we have as many histories as we have historians. There is no firm point upon which you can take your stand; all around you is shifting, unstable, and uncertain—like a feverish dream in which everything, as you try to grasp it, suddenly becomes something else—or like the mirage of the desert, which, from every different point of view, assumes an altered aspect.

We can neither accept nor reject everything in these early tales: but whether it be attempted to decide *ex cathedra* what is true and what is untrue, or whether it be sought to reconstruct from the *disjecta membra* a new version of events, I would fall back upon Niebuhr's *dictum* in one of his soberer moments, and acknowledge it as the only safe principle which can govern us: "If any pretend that he is able to decide in questions of such obscurity, let none listen to him." We must take the legends as they stand, with all their faults and with all their beauties. We may call attention to their inconsistencies, but we cannot reconcile them; we may point out their improbabilities, but we cannot separate the true from the false. But amidst all this doubt one thing is certain—that, whether true or untrue, they were believed in by great nations of antiquity, and they thus form an integral portion of the better authenticated history of the race. We can no more arrive at a true conception of a Greek or Roman of historic times, without the knowledge of their earlier

(23) Hist. I., p. 40.

(24) Lect. Ant. Hist. I., p. 249 (lect. xxii.).

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legends, than we can imagine an ear of wheat without the grain from which it sprung. If all the heroes and all their exploits were fictitious, the very formation of the fiction had its origin in a state of society, in a tone of thought, and in a moral and intellectual condition, of which it is itself the best exponent. The legends may not contain a veritable history of events, but they are an important contribution to a true history of the human mind. They are even more, for the firm belief in them reacted upon the national character, and through the Greeks and Romans this influence has extended down to us, and will leave its impress upon the literature, the thoughts and the actions of the latest posterity.

I cannot close these remarks more appropriately than in the words of Grote, the safest and most philosophical of our historians. They apply more particularly to the mythological periods of Grecian history, but they embody the only useful method of treating the first dawn of the history of any nation. "I describe the earlier times by themselves, as conceived by the faith and feeling of the first Greeks, and known only through their legends, without presuming to measure how much or how little of historical matter these legends contain. If the reader blame me for not assisting him to determine this,—if he asks me why I do not withdraw the curtain and disclose the picture,—I reply in the words of the painter Zeuxis, when the same question was addressed to him on exhibiting his masterpiece of imitative art: 'The curtain *is* the picture.' What we now read as poetry and legend was once accredited history, and the only genuine history which the first Greeks could conceive or relish in their past time: the curtain conceals nothing behind, and cannot by any ingenuity be withdrawn.—I undertake only to show it as it stands,—not to efface, still less to repaint it." (25).

(25) Pref. p. vii.

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Paper II.—GOLD FIELDS OF NOVA SCOTIA.

By Dr. ANDERSON.

[Read before the Society, 4th November, 1863.]

In the *Illustrated News* of 9th March, 1850, will be found the report of an address delivered by Sir Robert Murchison before the Royal Institution. It is there stated that Sir Roderick gave as an axiom, that gold ore never occurs in any great quantity except under certain conditions of "*constants*," viz.: when the ancient stratified rocks, constituting the backbones of continents, or great islands, have been penetrated, and altered, and crystalized by the intrusion of igneous or eruptive matter. In the course of his address Sir Roderick repeatedly dwelt on the *fact* that the auriferous veins invariably deteriorated in the per centage of gold to the weight of quartz, *the deeper they were traced.* That all the rich portions are found at or near the surface; hence the powerful attrition which the surface has undergone in ancient times had disintegrated the greater quantity, and distributed the freed gold in heaps of gravel and sand over plateaus or in valleys. He shewed that mining in the Ural Mountains and in Mexico proved *that gold decreased according to depth, when it finally ceased and was replaced by silver.*

Sir Roderick further remarked, that Job was a true and good geologist, when he said, "There is a *mine* for the silver, and the earth hath dust of gold." That it would be in vain to assign any limits to the productive value of silver mines, when science had been fully applied to them, for they increase in value as in depth, whereas gold diminishes as we descend to seek it.

Sir Roderick inveighed strongly against the popular delusion, that the Californian gold regions, then recently discovered, would be all equally productive, basing his opinion on the presumption that there could be no variation from the *constants*, which he appeared to view as a law of nature.

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In connection with Sir Roderick's allusions to Job, it is interesting to turn to Job himself; and as some points of connexion are evidently wanting in our common version, I have had recourse to that of Good, which certainly proves Job to have been an excellent geologist.

Good thus translates the 28th chapter of Job: "There is a *mine* for the silver, and a *bed* for the gold which men refine. Iron is dug from the earth and the rock *poureth* forth copper. Man delveth into the region of darkness, and examineth to the utmost limit, the stones of darkness and death shade; *he breaketh up the veins from the matrice, which, though nothing thought of under foot*, are drawn forth and brandished among mankind. The earth itself poureth forth bread, *but below it windeth a fiery region; sapphires are its stones, and gold is its ground.*" "Man thrusteth his hand into the sparry oar; he upturneth the mountains from their roots; *he cutteth out channels through the rocks, and his eye discerneth every precious gem.* He restraineth the waters from oozing, and maketh the hidden gloom become radiance."

In a note to this chapter, Dr. Kitto gives an extract from Agatharchides, who lived in the first century before Christ, describing the mode in which the auriferous quartz mines of the Red Sea were worked by the ancient Egyptians,—all tending to prove that quartz mining and crushing, as well as washing gold from the sands of the beds of rivers, were about as well understood two thousand years ago as they are now.

I look upon Dr. Kitto's note as the more important, as it was published in 1837, before any new discoveries of gold had been made or thought of; consequently he could not have been influenced by the knowledge which has since been acquired.

I have thought it well to bring the views of Sir Roderick Murchison prominently before you, as they justly exercised an important influence, and it will be interesting to mark how far experience, to this date, has verified them.

We have now the advantage of a very extended field from whence to draw our conclusions; 1st. In the gold regions of Aus-

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tralia, discovered by Count Strelecki in 1839, though not worked till 1851 ; 2nd. In California, discovered by Capt. Sutters, in 1847; 3rd. In Nova Scotia; and, lastly, in the gold regions of the Chaudière.

The coal mines of Nova Scotia have been worked for many years, and furnaces were erected, some time ago, for smelting iron ores, which, at Londonderry in particular, were found of great extent and richness. Specimens of copper ore had also been found in various localities, but the existence of gold was unsuspected till 1860. "It is strange," says Mr. Howe, the late Provincial Secretary, "that the auriferous deposits should not have been turned up by the agriculturist or roadmaker; still stranger, that they escaped the vigilance of the early pioneers of natural science. Dr. Dawson, in 1855, suggested the possibility of finding gold in Nova Scotia, and indicated, with some accuracy, the regions in which it might be discovered. But the doctor had found none, and no interest was taken in the matter until gold was discovered last summer (1860), in the neighborhood of Tangier."

Dr. Dawson, in a paper which he read before the Natural History Society of Montreal, in 1861, said: "It has been remarked, that it is wonderful, that in a district so thickly settled and so much subjected to the operations of the surveyor, roadmaker and agriculturist as the south coast of Nova Scotia, so numerous deposits of gold should so long have escaped observations. Geologists, also, and mineral explorers have repeatedly visited and passed through the district. Still, when it is considered that the country is netted with quartz veins, and that perhaps not more than *one in a million* of these is appreciably auriferous, the wonder ceases. Ordinary observers do not notice such things. A geologist not specially looking for useful minerals, soon becomes wearied of breaking up and examining barren veins of white quartz, and certainly cannot spare time to spend two years in *prospecting* like the persevering discoverer of the Wine Harbour district. My own field notes contain the record of many days of hard work among

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these unpromising rocks, and countless quartz veins have suffered from my hammer without yielding a speck of gold. I believe I have visited all the localities of the discoveries, except Tangier, and in some of them, as at the St. Mary's, Indian Harbour, and Wine Harbour, I have spent days in examining the rocks, not certainly with a special view to the discovery of gold, but often with the assistance of intelligent friends who were good observers.—The truth is, that in cases of this kind, *it is difficult to make the initial discovery; but this once made, it is comparatively easy to trace* the productive rock over considerable districts, if the requisite knowledge of the geological character of these has been obtained."

I shall add, from my own personal observation, that there could have been little chance of the discovery having been made by the agriculturist, as the Nova Scotia gold fields present an aspect of "unpromising rocks" and soil totally unsuited for cultivation, and which must have ever remained waste or barren, the shrubs nnd scanty herbage occasionally affording a precarious subsistence to a few wild animals and birds, and possibly to the sheep or stray cattle of settlers on the adjoining cultivable lands.

One of the principal features in the geology of Nova Scotia is the mountain range extending along its Atlantic coast, exhibiting a series of metamorphic rocks, which Dr. Dawson supposes to belong to the lower part of the Lower Silurian system, the same as are found on the Chaudière, and extending along the Eastern Townships, may be traced south-westerly through New England, and along the Apalachian chain to Georgia, furnishing gold in greater or less quantity throughout the whole extent.

Dr. Dawson has given a map, shewing the geographical position of the beds, from Cape Sable in the west, to Cape Canseau in the east. The outcrop may be traced N.E. and S.W. along the coast about 250 miles, and inland, in some places from 20 to 30 miles; and when least altered or disturbed, it consists mainly of thick beds of quartz and slate alternating with each other. The order is: First, Secondary trap; second, New red sandstone; third,

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Carboniferous; fourth, Devonian; fifth, Middle and Upper Silurian; sixth, Metamorphic, Lower Silurian, *Auriferous*, the gold occurring in irregular grains and masses, in white, milky, or translucent quartz, often stained by the hydrated peroxide of iron; and seventh, Granite.

Mr. J. Campbell, who carefully examined the gold districts of Nova Scotia, has furnished a map of a section from Halifax harbor to Renfrew gold field, a distance a little over thirty miles, shewing that there are no less than six lines of elevations or anticlinal axes, and that scarcely two miles of vertical thickness are brought in section to the surface.

According to him, the horizontal section of the strata shews, first, blue and grey slates; second, black rock; third, blue and grey slate; fourth, quartzite group.

Mr. Campbell has also pointed out that in the first great upheaval, the rent was east and west; but that a later one took place in a transverse direction from north to south, *and that it is chiefly where these intersect each other* that the gold bearing rocks are brought to the surface. Mr. Campbell appears to think that both these upheavals occurred anterior to the glacial period, as indicated by the small grooves on the exposed rocks, especially on the Halifax peninsula, and that the gold, which is found, in some instances, at a great distance from the quartz formation, was carried there by the denuding and desintegrating force of glaciers.

The conditions under which gold is found in Nova Scotia are very similar to those of other auriferous regions. The principal point of difference is, that *the great amount of gold is found in the rock veins*, and a comparatively small quantity in alluvial lands. Mr. Campbell thus accounts for this state of things: "From the close vicinage to the sea of the gold bearing rocks of Nova Scotia, the greater portion of the gold removed from them by glacial action is now dispersed through the submarine banks and the sands of Sable Island, where it is found in appreciable quantity." He also asserts, that though gold is found in nearly all deposits of glacial drift, or boulder clay, on the south coast, it would cost too

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much to collect it by ordinary means, and that it is only when the drift has been *rearranged* in pockets that the gold can be found sufficiently concentrated to pay for working. From this we can understand how the fortune of gold diggers on the Chaudière has been so varied. By the merest chance one may stumble on a pocket where gold has been *concentrated*, as on the Poulin claim on the Gilbert, and a rich harvest may be reaped, while diggers on an adjoining claim may toil without any return.

The first discovery of gold in Nova Scotia was made by John Pulsiaver, in the summer of 1860. From what he had heard of the gold bearing quartz of California, he was induced to search among the rocks of the Tangier river, about fifty miles to the eastward of Halifax, and accompanied by some Indians he found several pieces of gold in quartz. On this being made known a number of persons rushed to the spot, for the purpose of prospecting, but gold not being found in remunerative quantity, the place was abandoned.

But in October of the same year, a fisherman at Tangier harbor, passing through the woods in the neighborhood of his own house, stooped to drink at a small brook, and noticed a small particle of shining yellow metal in a piece of quartz, which was there very abundant; he picked it up, and on examination it proved to be gold. Again a number of gold seekers flocked to Tangier, and on the 11th April, 1861, a deputy surveyor was sent out there, who took possession of the gold field for the Government, and immediately commenced laying off mining lots of 1000 feet across and twenty feet *along* the supposed course of the leads.

Nearly one hundred of these were soon leased at the rate of $20 per annum, paid in advance, and in a short time six hundred men were engaged in prospecting and mining, and the reported success which many met with occasioned a continued increase, till the discoveries in other districts were the means of attracting large parties thither.

Under similar circumstances, discoveries were successively made at Waverly, Oldham and Lawrencetown, in the county of Hali-

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fax; Wine Harbour, Sherbrooke and Stormont, in the county of Guysboro; Ovens, in the county of Lunenburg, and Renfrew in the county of Hants; and there can be no doubt that gold will yet be found along the whole mountain range from Cape Sable to Cape Canseau.

In 1862, *twelve* distinct auriferous quartz veins, varying in thickness from three inches to three feet, had been discovered at Tangier. This quartz is highly transparent, and contains iron pyrites, native copper and arsenical pyrites. In that year 707 tons were crushed, yielding 865 oz. gold, or 1.22 oz. per ton. This, however, does not give the true return of gold, as the richest "sights" are always selected by hand and crushed in a mortar by the miner himself. The chief commissioner reports that the average number of men employed was *seventy*, and that he had reason to know that the average return to each, for the season, was 12 oz.

The discovery of gold at Tangier was immediately followed by a like one at or near the Barasois, between Wine and Indian harbours; and the leads which proved auriferous in 1862, were seven in number.

Both Wine and Indian harbours, as well as Sherbrooke, in the immediate neighborhood of which are the "Goldenville diggins," are, like Tangiers, easily accessible both by land and water.

Sherbrooke is situated ten miles from the Atlantic, at the head of the navigation of the beautiful St. Mary, where vessels of five hundred tons burthen can load; it lies about forty miles to the east of Tangier. Wine Harbour is nine miles distant from Sherbrooke, by a road, about half of which is the most execrable that can be imagined. Those who have travelled over the old road from Quebec to Lake Beauport, can form a correct idea of the road and the country through which it passes.

Wine Harbour is about the size of Lake Beauport, and at the time of the discovery of gold, there was only one old house there, that of Captain Robar; but now dwelling houses, shops and warehouses are springing up in every direction at the village on the

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shore, while the whole face of the hill exhibits long lines of abandoned trenches, and shanties and shaft-houses dot the slope from the crest to the water. The ear is stunned with blasts going off every ten minutes; windlasses are at work raising the quartz from the shafts, and the steam crushers are thundering night and day at their work.

At the time of my visit, there were sixteen shafts being worked profitably; the other shafts were not in that state of advancement to justify expectation of remuneration. As a general rule, the shaft must be sunk fifty feet before the labour is remunerative. There were four hundred and fifty men engaged in mining operations. Many of the respectable married men had brought their families to reside there, and consequently silks and crinoline were to be seen in the streets.

At all the places I have mentioned, gold is found in the veins of quartz, which vary in size from one inch to four feet in thickness. At Wine Harbour these veins, which are generally white, are imbedded in blue slate or hard whinstone, and run in a direction nearly east and west; several of them have been traced from the head of the harbour to the point of the Barasois, a distance of three miles, where they dip into the sea.

The "Smith" lead, from which the largest quantity of gold had been obtained in 1862, shewed at the surface five veins of quartz, from one to three inches thick and from three to six inches apart, running in a band of slate about three feet thick and quite soft, with hard whinstone on each side; but at the depth of fifty feet the slate had nearly disappeared, and the whinstone had become much harder; and here there were found seven veins of quartz of the same size as at the surface; it being usual to find the veins, as they descend, converging till they form *one* lead. The richest quartz had been found at the depth of fifty feet, which yielded *six ounces* to the ton. Five tons from the "Hattie" shaft, on the same lead, had produced 125 ounces of gold, or *twenty-five* ounces per ton.

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As a general rule, the quartz at the surface yielded the smallest quantity of gold, which increased as the shaft was deepened.

The mode of working which prevails is, to sink a shaft five feet by twelve; eight men is the largest number employed at a shaft, and the mode of procedure is exactly that which may be seen in blasting the rock in the streets of Quebec; but as the shaft increases in depth, the windlass and tub become necessary for raising the quartz and rubbish and the *water*, which, according to depth and other circumstances, makes at from five to ten tubs per hour.

At first the quartz alone was sent to the crusher, the miners having first culled from it all the pieces in which there were "sights" of gold; but a more extended experience led to the sending of the greater portion of the rubbish, which, in some cases, was found to yield from one to one and a half ounces per ton.

There are now four crushing mills at Wine Harbour; three driven by steam and one by water. They are all in constant employment, crushing, each, from ten to fifteen tons in the twenty-four hours, for which they receive from three to five dollars per ton, according to the hardness of the quartz. The water mill cleared $1800 in 1862.

During the eight months of this year, the average number of men at Wine Harbour was one hundred and fifty-three; the yield of gold, *two thousand three hundred and forty-six* ounces, which were sold for $44,938; and since this return was made I have received information that two tons of quartz from the "Caledonia" lead had yielded *one hundred and thirty-three ounces* of gold: sixty-six ounces ten pennyweights per ton.

In 1862 the average number had been *one hundred and sixty* men; quartz raised, five hundred and seventy tons; value of gold, $21,918.

The discovery of gold at Sherbrooke took place in the summer of 1861. Nelson Nickerson, of that village, who had visited Tangier and made himself familiar with the appearance of the auriferous quartz there, on his return, being engaged in making hay on the north-west arm of the St. Mary, noticed quartz rocks scattered over the land. By breaking and examining them he found suffi-

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cient gold to encourage him to make it the business of himself and family, in secret, for several months. Suspicion, however, was aroused: he was watched by some neighbors, who, following the sound of his hammer, discovered him while at work. The greatest excitement followed the discovery, and for several days the village was deserted, one bed-ridden old man alone being left there. It is estimated that at one time several thousands of people had flocked to Goldenville; but after a considerable amount of gold had been collected, the harvest was exhausted, and the majority returned home disappointed; and it is very possible that this might have been the end of the gold fever, had not several Californian and Australian miners been also attracted to the spot, who were enabled to turn their experience to good account. The amount of gold at first found cannot be fairly estimated, though it has been stated to have been great; but to anxious enquiries Nickerson has expressed himself satisfied with his *pile*.

The district was laid off by a surveyor, and in a short time several companies were formed, operations on the surface were abandoned, and the sinking of shafts commenced. In all four hundred and eighty claims were taken up—many by parties on speculation; some by parties who worked them for a month or two, and not being satisfied with the result, abandoned them. Others, who had energy and capital, continued their operations, and have been rewarded with success, several having made fortunes; among these stand prominent the Hewitts, whose good fortune has never varied, their quartz having averaged *twelve ounces* per ton.

When I was at Goldenville in July last, *one hundred and twenty* men were at work, and three steam crushers had been erected.

A company under the style of the "Olive Branch," composed of six individuals, subscribed twenty-two pounds *ten shillings* each to purchase tools and supplies, with which they might commence operations; they sank their shaft, and worked during 1862, and at the close of the season, had nothing to show for the labour and capital expended, but their tools and the shaft. Being much discouraged, they offered to sell out for £100, but could

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find no purchaser. This season, after they had put in their crops, no other employment offering, but encouraged by the continued success of the "Hewitt" claim which adjoined them, they resumed operations, and fortune at once favored them; and when I visited "Goldenville" on the 17th July last, Mr. Archibald, the superintendent of the "Glenelg Crushing Mill," placed in my hands, warm from the crucible, a lump of gold weighing *eight pounds*, the product of nine tons of quartz raised from their shaft. This gold was worth $19.75 per oz., so the value of the lump was £472, or $1888. I was told that this would make the fifth dividend this season, which had averaged £80 per dividend to each of the six shareholders.

In concluding his report for 1862, the Gold Commissioner say: "The leads worked in this field, in general, increase in thickness with the depth; but it cannot be said that the quartz increases in richness as the depth increases. But in general, when gold is found in a lead at the surface, it is also found equally distributed to the depth as yet mined; and where it does not exist at the surface, it is seldom found below."

The past year, however, has given different results. Thus the "Cummings" lead, which last season gave, as a maximum yield, two and a-quarter ounces gold per ton, down to the depth of twenty feet, has, during the present, averaged *four ounces;* and a few weeks ago, five tons of quartz form this lead, yielded *fifty-three ounces* of gold, or very nearly *eleven ounces* per ton. This was the product of the labour of five men for five days, giving each $41.87 per day.

At Oldham, on the 21st August last, Messrs. Carpenter and Davis got crushed, at the Colonial Company's mill, *twenty-six* tons of quartz taken from their shaft at a depth of fifteen feet, which yielded *one hundred and thirteen ounces* of gold, being over four ounces six dwts. per ton. Their lead is from twenty to thirty inches thick, and the yield was the produce of one hundred days labour, giving $22.31¾ per man per day.

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On "Hull's" lead, the Messrs. McAllister had one and a-half tons crushed, which gave sixty-five ounces, fourteen dwts., equal to forty-three ounces, sixteen penny-weights per ton.

From the same lead, Messrs. Oakes and Malcolm, from two hundred pounds quartz, received seven and a-half ounces, or at the rate of *seventy-five ounces* per ton; the largest yield I have yet heard of in Nova Scotia, unless where the quartz had been hand picked, which was not the case in any of these instances.

Ordinary labourers receive 4s. to 5s. per day; carpenters and other artizans, from 6s. to 7s. 6d.

Contracts have been taken to sink shafts, five feet wide by twelve feet long, to the depth of fifty feet, at fifteen dollars per foot in depth.

The quartz, when quarried, is taken from the mouth of the shafts by the owners of the several mills, crushed and amalgamated, and the gold, if any there be, returned to the owner, the charge being from *three* to *five* dollars *per ton*, according to the hardness of the quartz; the cost of mining, crushing and amalgamating, being about ten dollars per ton.

Gold digging has been truly described as a lottery, in which the fortunate *few* have drawn rich prizes. Official returns to the Victoria legislature show that in 1860, the number of men employed in quartz crushing was 18,296, and the whole produce of the mines for that year was 93,025 ounces two dwts., which would give to each miner only *five ounces* for the year, or in cash, thirty-one cents per day.

The chief gold commissioner for Nova Scotia has shewn, in his return to the legislature in 1862, that the average number of men employed in the several gold fields during that year was 484, and that the average earnings of each man per day, was $1.18 cts.

But I know of an instance of an Australian miner, now resident in this neighborhood, who took from his claim, at the depth of *ninety-feet*, *twenty-one* tons of quartz, which yielded *one hundred and one ounces* of gold per ton, which at £3 18s. sterling per ounce, was of the value of $41,000. At nine feet, the

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quartz had yielded *twenty-eight* ounces, and at forty feet *sixty* ounces per ton. Experience in Nova Scotia, Canada, and Australia, has shewn that in no two localities is the gold of the same value or fineness. Thus Geelong gold was of the value of £3 18s., while Ballerat brought £4 4s. sterling per ounce. In Nova Scotia, the price varies, according to the quality, from $19 to $19.75. I have not yet personally tested the gold of the different tributaries of the Chaudière; but judging from appearance, I am disposed to believe that it varies in fineness.

Experience in Australia, I think, has also established, as it has done in Nova Scotia during the present year, that the quartz veins generally increase in richness as they descend, though in no regular or fixed ratio. I am not aware of any great yield being furnished at the outcrop, and I was informed that, as a *general rule*, little more was expected from the vein than sufficient gold to pay working expenses, down to the depth of fifty feet; but that from fifty to ninety feet a very remunerative yield was obtained. I have mentioned several cases where at a depth not exceeding fifteen feet, a very large yield was obtained; it will be interesting to observe whether in these instances the richness will increase with the depth. In the Hewit lead, the shaft has been sunk to the depth of ninety feet, the maximum yield having been sixteen ounces per ton, and the average of the whole ninety feet being *five ounces* per ton.

On my return from Nova Scotia in 1862, I recorded my opinion, "That the mining operations, up to that date, went to prove, that gold was to be found in large quantities; that unskilled labour had in some cases been successful, but more frequently a failure; that skill and capital united would generally prove remunerative, and in some cases highly so; that it was impossible to say how rich the veins of quartz might become as they descended; that the shafts would have to be sunk deeper, and covered in for protection against the rain, to enable the work to be prosecuted in winter, and that steam engines, crushers and amalgamators in greater numbers would be essential."

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During my recent visit I found that these views had been realized to the fullest extent, and that gold digging in Nova Scotia is no longer a problem to be solved, but is now established as one of the great industrial resources of the province, which will continue to give steady and profitable employment to capital and labour every year, in an increased ratio. While proving also that we are not justified in laying down any fixed laws under which gold *may* or may *not* be found, I am convinced that the operations of the past season in particular have pretty satisfactorily established the important fact to which I have already alluded, that the quartz veins increase in richness as they descend.

The Government of Nova Scotia has been wise in its generation. It early perceived that great jealousy existed, lest privileges should be yielded, which would confine mining operations to the few rich, and check the enterprise of the energetic poor man. They therefore passed a measure through the legislature, which gave every facility and encouragement to the voluntary exertions of the people. Individual exertion was not discouraged, while science and capital were attracted, and the auriferous deposits have been tested to a far greater extent than they would, had a less liberal policy been followed. But it is now freely admitted that while the labour of the individual without capital has given a most valuable impulse to mining operations, and has proved the great riches of fields, which without it would never have been explored, it has generally entailed loss and disappointment, and the poor man has found that he will best consult his own interest by working under companies, at fixed wages.

I shall now leave every one to form his own conclusions from the statements I have furnished, and will only add, that in my opinion, the history of the gold fields of Nova Scotia will be repeated at the Chaudière. As soon as the supply of gold from the beds of the Gilbert, Du Loup, Famine and other tributaries of the Chaudière shall fail, as it undoubtedly soon will, those who engage in the enterprise must turn their attention to quartz crushing, which exists in great abundance on the adjacent ridges. I understand

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that the attention of the Canadian Parliament has been directed to the subject, and that they are about to legislate on it. The Government of Nova Scotia have, by their legislation, the right to resume such lands as had been found sufficiently prolific to be laid off as gold fields, and had wisely and liberally laid them open to free competition. A year's experience has induced them to make some slight modifications in the law. The gold fields are laid off in claims of three-quarters of an acre, and in some peculiar cases of five acres. All are open to public competition, and the Government only requires from those to whom claims are assigned, that they shall faithfully perform a fixed amount of labour on each claim during each year, and make a true return of the gold found, on which a royalty of three per cent. is paid.

A similar law enacted in Canada, with the modifications rendered necessary by the tenure of lands, would open a field of active and no uncertain enterprize, of which many would be disposed to avail themselves,—would put a stop to wild speculation, and the formation of mammoth *bogus* companies, and would yield a source of large and permanent revenue to the province.

NOTE.—In reference to the opinion once entertained that gold decreases as we descend to seek it, it may be of interest to state a few well-ascertained facts bearing on the subject.

In Brazil, at St. John del Rey, there is a metamorphic rock, which has been worked by an English company to the depth of 450 feet. The gold is invisible and equally diffused through the rock, which throughout its whole course has given an *equal* yield of five-eights ounce per ton.

In Australia, at Ballarat one quartz vein has yielded 200 ounces gold per ton, and the Prince of Wales shaft, which has given large profits, has been sunk to a depth exceeding 480 feet, and was still productive.

In California, the blue lead, a *placer* digging, supposed by some to be the bed of an ancient river, is described by Hittel as

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extending "for miles and miles, *a thousand feet below the summits of high mountains and entirely through them,*" and "millions of dollars have been taken from this bed, and its richness, in portions longest worked, *is yet undiminished.*"

In California, Australia and Nova Scotia, Professor Dana, Sir R. Murcheson, and Dr. Dawson severally indicated, from scientific deductions, the possibility of gold being found in the districts where it was subsequently and accidentally discovered; but in the actual discovery of mines, "chemists, geologists, mineralogists and *old miners* have not done better than ignorant men and new comers. Most of the best veins have been discovered by poor and ignorant men. Not *one* has been found by a man of high education as a miner or geologist. No doubt geological knowledge is valuable to a miner, and it should assist him in prospecting; but it has never yet enabled anybody to find a valuable claim."

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Paper III.—THE GOLD FIELDS OF CANADA.

By Rev. Mr. DOUGLAS.

[Read before the Society 18th November, 1863.]

The first discovery of gold in Canada was made by a woman, near the mouth of the river Touffe de Pins, or Gilbert, a tributary of the Chaudière, some forty years ago, but it attracted no attention. In 1834, another woman, taking a horse to water near the same spot, perceived, as she supposed, a stone glittering in the bed of the river, and thinking it curious enough to preserve, took it home with her. It was not however till the following year that she became aware of its value. Shortly afterwards the discovery was made public in *Silliman's Journal*, by General Baddeley, then a lieutenant of the Engineers, and one of the most active promoters of our society. He stated that the piece lately found weighed 10.63 grs. He was not aware that it had been chopped off a nugget, the remainder of which weighed 1056 grs. His information was, therefore, not calculated to arouse any other than scientific excitement. So little interest, indeed, did the discovery occasion, that no mention of the important event is made in either of the cotemporary newspapers. Had gold mining, however, been then understood as it has been since the discoveries in California and Australia have revolutionized the system of working, and abolished the old and cumbrous method, some excitement might possibly have arisen, and the mineral resources of our country have been developed long ago. As it was, the discovery was again almost totally forgotten, the only person, seemingly, who took any interest in it being the Seignior, M. DeLéry.

One of the earliest reports of the Geological Survey, that of 1847-48, contains a long description of the geological formation which extends throughout the aurifcrous region of Canada, and points out its resemblance to the geological features of those

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other regions, upon this and other continents, where gold has been discovered, but especially its intimate relation to those parts of Vermont and the Southern States, whose rocks and alluvial deposits are auriferous. And almost every subsequent report, up to 1853, contains further information on the geological and mineralogical characteristics of our gold fields—information so minute and correct, that nothing of importance has been added to our knowledge of the subject from other quarters.

Curiously enough, at this very time gold was found to exist in minute quantities in a vein on the 17th lot of the 7th range of Ascot, near Sherbrooke, thereby; at this early stage, exhibiting the wide range of the auriferous field.

Exploration was now carried on vigorously on the Chaudière and its tributaries, and it soon appeared that the main river and all its tributaries, great and small, from Ste. Marie almost up to Lake Megantic, were, more or less, charged with gold. Owing to the sluggishness of the main stream up to its junction with the Du Loup, that is, over at least twenty miles of its auriferous bed, nothing more than prospecting has been done upon it, except at one or two spots where it has laid bare the ledge, as at the Devil's Rapids. There a highly remunerative quantity of large gold has been found. But, while all its tributaries were discovered to be auriferous, it was found that, at least below the bend of the river, at the mouth of the Du Loup, the streams which flowed in from the west were poorer than those which drained the ridge on its east bank. These are the Guillaume, the Des Plantes, the Touffe de Pins, and the Famine, with a number of insignificant rivulets. Where the Chaudière and the Du Loup join, they are streams of about equal bulk. Here the Chaudière takes a bend and runs almost due north and south, while the Du Loup flows in from the south-east. The current of the Chaudière becomes now much more rapid, and at two spots, at the Greater and Lesser Falls, both within two miles of the junction, the ledge is exposed for a considerable distance. At both these spots gold was early found jammed in the crevices of the slate. More recently, the streams above this point,

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especially the Stafford Brook on the right bank and the Condé on the left, have been successfully washed for gold. The same result has attended the exploration of the Du Loup and its tributaries, up the boundary line of the State of Maine.

In 1846, M. DeLéry obtained a patent from the Crown, giving him the exclusive right forever to work for gold within the limits of his seigniory. The conditions of the patent are: "That our said grantees, their heirs and assigns forever, shall strictly conform to all laws and usages in force, and applying in that behalf, that they shall well and truly repay to other our loving subjects such damages and compensations as may from time to time accrue in consequence of the ground occupied, the opening of roads, and other like causes from the operations in working the said mines. And also, upon the condition that before working the same, they do transmit and deposit with our Secretary of our said Province a true and correct statement of the nature, situation and extent of the said ores, minerals and mines. And further, upon condition of transmitting, in each and every year, to our Receiver General for our said Province, a true and correct account of the gross product of the same, in such form and manner as our heirs and successors may be pleased to direct; and also, upon condition of well and truly paying and delivering, in each and every year, from the time of melting the said ores for the first time in working furnaces, unto our Receiver General, or such other person as may have authority from us, our heirs and successors, one-tenth part of the whole gross product of the said ores, minerals, and substances thereunto appertaining whatever; the said one-tenth part being melted, cast and prepared in the same manner as the like may be for the behoof of our said grantees, and refined according to the laws of France, as confirmed by the Edict of His Most Christian Majesty of the month of June, 1601; and it is further our will and pleasure that our said grantees have a remission of the said one-tenth part for five years from and after the date of these presents."

In accordance with the conditions of his patent, he had the district explored by Mr. Cunningham; but unwilling to run the risk

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of working himself, leased all his rights to the Chaudière Mining Company, in consideration of receiving an improved royalty, amounting, for the first portion of the leasehold term, to twenty-five per cent., and for the latter to thirty-three and a-half per cent. This arrangement not being found to answer, the improved royalty was bought up for a fixed sum. The company obtained also the right of working in the fief of La Barbe, through which the lower part of the Famine flows.

It began its operations on the Touffe de Pins, at a point about a mile from its mouth, where the river had gradually receeded from its original bed, leaving behind it an extensive flat covered with eight or ten feet of *débris*. Here the company worked for several years, but so unskilfully and so lavishly that the receipts did not cover the expenditure. It is to be regretted that the first attempt should have been made under circumstances so little likely to prove successful, for the signal failure of the company helped to retard the progress of the mines. The Des Plantes was also worked in several places. At one spot, immediately above the first fall, a rich deposit was struck upon, which yielded, for several weeks, from three to ten ounces a day. Here also was tried the experiment of dry-digging. The deluvial deposit was washed from the hill-side far above the level of the brook, and, though not with such success as to encourage the company to proceed, yet with sufficient to prove the existence of so much diffused gold as would entitle any one to employ, with a confident hope of remuneration, some more rapid system of washing, such as the hydraulic process described by Mr. Hunt in the *Canadian Naturalist* of April last. This stream is peculiarly suited, likewise, for such an experiment, its bed being narrow and the enclosing hills steep, while a supply of water, with a head of seventy or eighty feet, may be had from a fall not half a mile distant from the old dry diggings.

It was on this stream and on the Famine that the company was working, when Lord Elgin visited the mines in 1853.

On the latter river but little was done, and that on so small a scale as not fairly to test its capabilities. As, however, it has

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always been a favorite stream with the *habitants*, it must have produced a considerable quantity of gold.

In size the gold of the Famine resembles that of the Du Loup, being smaller than that of the Touffe de Pins, where again there is much less large gold than upon the Des Plantes. From the circumstance of its only being found in rapids, the gold of the main river is uniformly heavier than that of any of its tributaries; but if the flats were washed, they would probably be found impregnated with the finest dust.

While the Chaudière Mining Company was working within its limits, the Canada Mining Company obtained the right to wash for gold on the flats at the mouth of the Du Loup. Here it carried on extensive operations in the summers of 1851 and '52. Its works were superintended by an old Cornish miner, a Captain Otey, who adopted the system used in Cornwall for washing alluvial tin. As reported in the Geological Report for 1852, "The gravel for about three-eight of an acre, with an average thickness of two feet, was washed and yielded 2,107 dwts. of gold, of which 160 were in the form of fine dust, mingled with about one ton of black iron sand, the heavy residue of the washing. The value of the gold was $1,826, and the whole expenditure connected with the washing, $1,643, leaving a profit of $182.

"In 1852, above three-eighths of an acre were washed, and the total amount of gold obtained was 2,880 dwts., valued at $2,496. Of this 307 were in the form of fine dust mixed with the iron sand. Nine of the nuggets found weighed together 468 dwts., the largest being about 127, and the smallest about 11 dwts. Small and unimportant portions of platinum and iridosmine were found. The washing lasted from the 24th May to October 30th, and the sum expended for labor was $1,888, leaving a profit of $608."*

Had the same amount of labour been as systematically and scientifically employed elsewhere, there is reason to think the result would have been more encouraging: for at the spot selected the gold is so fine and so widely scattered, that it would be impos-

* Geology of Canada, page 874.

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sible to gain a moderate day's wages in panning, whereas in the more restricted channels of some of the smaller streams, panning is remunerative. The experiment is all the more valuable, however, on that very account.

The Canada Gold Mining Company was obliged to abandon its works on account of some disagreement with the proprietor of the land adjoining.

On the same spot the Napanee Company endeavored afterwards to sink a shaft through the slate, in the hope of finding beds of auriferous sand beneath, such as in California they believed to yield the richest returns; but after two years' boring, they abandoned their foolish attempt.

Since 1855, the diggings have been abandoned to the depredations of the *habitants*. It was their interest to conceal any success which attended their panning, lest tribute should be demanded of them. But as it requires more than an ordinary inducement to drag the *habitant* from his warm stove to work knee-deep in water all day long, few were tempted. The only men who have worked perseveringly are the Poulins. There are five brothers, all men brought up to a bush life, and better able, therefore, to endure the fatigues of gold-washing than their neighbors. They are not lacking in intelligence, and two, at least, are intensely avaricious—eminent qualifications for successful gold-seekers. It has always been as difficult to estimate their success as to catch them at work. Their fire might frequently be found burning, and the picks and shovels they had thrown down in their haste to escape, but never themselves. The difficulty of finding them was enhanced by their mode of operating. Opening a passage in the side of a bank not larger than would allow them to crawl in, they struck the ledge, and by degrees bored their way along its surface, clearing it of the subjacent gold without displaying the extent of their work. One of them, last summer, admitted having worked for years, but nothing more precise could be elicited than that he had at times "found very little, but at others a good deal." Another brother, when asked by the *curé* to give

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the church gold to gild the high altar, replied he could give what would gild the whole church. Exaggerated reports have, no doubt, gone abroad of their wealth; but, nevertheless, they must have found more than the wretched manner in which they live would lead one to infer, for their good fortune has not in the least improved their outward condition. The gold being stolen, they were always fearful of doing anything which would disclose their success.

Yet, however much they may have found while scouring the river bed, they probably never struck on any such rich deposit as that which has created so unusual a fever throughout the province during the past summer. The spot is on the north branch of the river Gilbert, about four miles from its mouth. It was too late in the season, when the discovery was made, to do more than ascertain its exceeding richness, but so soon as the spring freshets had subsided, they betook themselves to work, and with such success, that the fame of their good fortune spread rapidly through the parish, and the most impassive of the *habitants* flocked to the locality. The river was explored for about a mile of its length, and two spots selected as the richest; one on the lot of a man called Veilleux, the other about fifteen acres lower down, on Rodrigue's land. The upper diggings attracted the greatest crowds, and up to the middle of July, Rodrigue himself and three of the Poulins, his associates, were undisturbed in their possession of the lower diggings. Within the six weeks—from the beginning of June till near the middle of July—several acres of ground in Veilleux's lot were thickly perforated with holes, and the bed of the river pretty thoroughly washed out. The bailiff, who was sent by Mr. De Léry to drive them off, took down the names of about seventy persons. Of these a large proportion were, perhaps, merely looking on; but, judging by the quantity of work got through, there must have been as many as fifty people, on an average, washing during the six weeks. Very few were willing to make returns, not so much, perhaps, through dishonesty, as because, when demanded, the gold was sold and the proceeds dis-

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posed of. The largest piece found was said to have been picked up by a woman named Parré, and to have been sold for £22. One party of six, including the two most noted Poulins, acknowledged finding fifteen ounces in three days; and another party, of the same number of hands, found six and a half ounces in two days. After the unlicensed diggers were driven off, part of the location was thoroughly washed with ground sluices by Messrs. Parker, Hagens & Co., who have bought a continuation of the lease, under the superintendence of a Californian, Mr. Percival. The work might have paid, had not so much unproductive labor been expended in clearing away the ground already worked. Between the upper and lower diggings the stream is rapid, and flows often over a bare ledge, but is still bordered on the right by narrow alluvial flats (which, however, were not found to be sufficiently productive to be worked profitably with such appliances as were used last summer), and on the left by a steep ridge, which it is gradually cutting away. The lower diggings seem to have been caused by a bar of hard rock, which, crossing the stream almost at right angles, appears to have intercepted the gold in its downward progress; for below the bar nothing of any consequence has been found, while immediately above it the yield has been enormous. The soil became poorer as it receded upwards. It was just above the bar that Rodrigue and his company worked the bed of the river in the beginning of the season, and it was here they bought the location which has proved so rich. Up to the middle of July no work had been done upon the banks, the crowd being retained at the upper diggings, and the bed of the stream affording occupation enough to the four men who composed Rodrigue's party. They worked eleven full days, and found, with nothing better than tin pans, 10 lbs. of gold. And be it said to their credit, they were honest enough to admit it, and give a quarter in tribute.

The location which, after this, Rodrigue and his party bought was one hundred and fifty feet long by fifty feet wide. They selected a part to work themselves, and sold the rest piece-meal, at prices which must have brought them in several times what they paid

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for the whole. Their find, after exhausting the bed of the river, somewhat fell off; but while washing the banks they got, for instance, one day 1 pound, and the following 10 ounces. But it must be remembered that this was with the assistance of a ground sluice, whereas previously they had used only a tin pan. Their largest piece was sold for $200; the next largest weighed almost a quarter of a pound. What they found in all they did not know themselves, as they frequently sold parcels of gold without keeping accurate account of it; but the proceeds of the summer did not probably amount to less than 24 lbs., which would give 6 lbs. (worth $1296) to each man; or, supposing them to have worked eighty days, that is twenty days a month for four months, which is more than probably they did, their wages were per man over $16 a day, and deducting tribute during the early part of the season and the price of location, say $14. One day Rodrigue, working alone with an old man, panned 2 ounces 2 dwts. and 8 grains, worth $38. Their success, however, must not be taken as the measure of others' fortune. None else were so lucky as they, and few of those who purchased locations higher up than Rodrigue's or further from the river, were repaid for the outlay and their time. This has been and always will be the fate of gold diggers. To reduce the average find to one dollar a day per man, which is Australian wages, sixteen men must find nothing to compensate for the good fortune of one such as Rodrigue.

The conditions under which the alluvial gold is found vary with the different character of the river beds. The Des Plantes, between the lower and upper falls, where alone any mining has been done, is narrow and precipitous; there is, therefore, but little depth of deposit upon the ledge, and that of a gravelly nature; hence the gold is found in largest quantity upon the ledge. The bed consists of a hard grauwacke schist, dipping almost perpendicularly and interstratified by large dykes of serpentine. Above the second fall its character totally changes, and it runs sluggishly over a kind of plateau. This part has not been thoroughly ex-

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plored. The Touffe de Pins is also rapid, but the valley through which it runs is seldom so narrow. Beds of clay alternate with those of gravel to the depth, sometimes, of eight and twelve feet; and a stiff clay, when lying immediately upon the slate, is often as rich throughout as where it rests upon the ledge. This was the case at several spots at the Rodrigue mine. The bed is composed of dark slate, very open in its cleavage. The Famine resembles generally the Touffe de Pins; but about a mile and a half above the falls, that is about five miles from its mouth, there commences an extensive deposit of clay, sand, and gravel. Sir W. Logan reports, in 1850-51, having "followed the section made through it by the river for about a mile and a-half, and constantly found the clay beneath and the gravel resting on it. Toward the top of the gravel, the bank often presented a horizontal deposit of mingled oxyde of iron and manganese, in some parts six and eight inches thick, filling the interstices among pebbles of various kinds. Gold is found in the underlying gravel as well as in the clay beneath; both of which deposits appear to belong to the modified drift." * A great quantity of gold is said to have been found this last summer about the head waters of the river. Gold occurs in the Metgermet, a tributary of the Du Loup, under the same curious condition as in the Famine. There the beds of stratified material attain a height of fifty feet above the bed of the river.

Where gold has been most extensively worked in the Du Loup, that is at its mouth, the deposit is composed of loose gravel, averaging not above two feet in thickness.

With regard to the quality of Chaudière alluvial gold: an assay of a sample made by Messrs. Thomas, Abell & Co. shows it to be 3¾ grains worse than standard, with 28 dwts. of silver per lb. But different samples vary greatly in their purity, according to the size of the gold and the locality whence it comes. The following results of assays by Mr. Hunt are given in the report of 1852-53, and are repeated in the General Report of the Geological Survey:—A small mass from St. Francis,

* Also, General Report, page 139.

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Beauce, contained 13.27 per cent. of silver. The specific gravity of five worn fragments of gold from Rivière du Loup was as follows: 15.76,—16.49,—16,65—17.60,—17.77. The third specimen, after being hammered into a thin plate and annealed, had a specific gravity of 17.024, and gave 13.60 per cent. of silver. The fifth, after a similar treatment, acquired a specific gravity of 17.848, and gave 12.23 per cent. of silver. A third specimen, in fine scales, had a density of 16.57, and contained 10.76 per cent. of silver. It would seem from the variations in specific gravity, that these specimens of native gold were not homogeneous, but were cavernous, and held earthy impurities. An apparently pure fragment, weighing 7.5 grammes, had a specific gravity of 15.76; but by prolonged fusion with nitre and carbonate of soda, it lost 1.76 per cent. of its weight, and acquired a specific gravity of 17.43. In the assays above given the gold was precipitated by oxalic acid from its solutions, which contained, besides, only traces of copper and iron. The pure gold thus separated, after fusion with nitre, had a specific gravity of 18.68—19.94, as determined on two specimens.

A portion of the gold dust from the washings at the Rivière du Loup was subjected to amalgamation, and left one third of its weight of black ferruginous sand, of which eighteen per cent. were magnetic. The non-magnetic portion was rendered soluble by the successive action of hydrochloric acid and fused bisulphate of potash, leaving 4.8 per cent. of silicious residue. From the solutions which contained iron and chromium, ebullution threw down 23.15 per cent. of titanic acid. The liquid was examined without success for tin, uranium, cerium, and the rarer metals, which are sometimes found in the auriferous gravel of other regions. The gold obtained by the distillation of the amalgam lost 4.27 per cent. of its weight by fusion with borax, and the assay of the resulting ingot gave 12.87 per cent. of silver. This gold contained neither copper nor palladium, but a minute trace of platinum."*

As much uncertainty must exist with regard to the source of the gold, as to the mode of its distribution. Till, in fact, the latter ques-

* General Report, page 520.

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tion is satisfactorily settled, it would be unsafe to decide positively on the first. Sir W. Logan speaks cautiously, therefore, when he says:—"The source of the gold *appears* to be the crystalline schists of the Notre Dame range, and the materials derived from their disintegration not only constitute the superficial material among the hills of this range, but are spread over a considerable area to the south of them." In the report for 1852, Sir William attempts also to define the geological position of the auriferous drift: he supposes it to be of greater antiquity than the drifts occupying the valley of the St. Lawrence, which contains remains of the whale, seal and two species of fish. The highest point at which this drift occurs is in the Montreal mountain, at 470 feet above the sea level, whereas the lowest point of the surface of the Chaudière drift is 800 feet. No traces of organic remains have been discovered in the Chaudière drift.

Whether quartz be the original matrix of all gold or not, a good deal of the large gold on the Chaudière is found with more or less quartz adhering to it, and several specimens from placer-deposits are almost embedded in this rock: and that although no vein yielding such large gold has yet been opened. The same difficulties exist to some extent in accounting for the aquaeous distribution of the precious metal on the abrasian theory here as elsewhere. Yet the agency of water in accumulating the gold at all those spots where an unusual quantity has been found is very apparent. At the top of the Des Plantes fall, and at Rodrigue's location, a high ledge of harder rock than the slate which it intersects crosses the river, forming just such a barrier against the action of the water upon gold, as is the bar in the cradle or the tie.

But though no very productive gold-bearing vein has been opened, it is true that in several of the many veins which cut the slate, specks of visible gold have been discovered, and in a few instances, very pretty specimens have been taken out; and when all the veins have been tested, it will doubtless be found that many are auriferous; perhaps so richly charged, though nothing is now

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visible to the eye but the mass of milky stone, that they can be worked with advantage.

On the river Guillaume, gold is found associated in small quantities with white garnet rock. An auriferous vein crosses the Des Plantes a little below the first fall, from which specimens of visible gold were taken several years ago. Another well-defined vein cuts the slates near the head of the Great Rapid, where visible gold occurs, associated with rich argentiferous galena, sulphuret of zinc and iron, and arsenical pyrites; and about fifty yards above this, a thin vein not six inches wide, has yielded very beautiful specimens of the precious metal. No properly-directed attempts have been made to ascertain their value; for though a good deal of work was done upon the large vein at the head of the Rapids, the object kept in view was the finding of visible gold only. Several assays have been made of its contents, which show gold to be disseminated through it; but no large quantity has been crushed and treated with mercury, so as to ascertain its general richness. Mr. Hunt reports it to contain "argentiferous galena, blende, mispeckle, besides cubic and magnetic pyrites, with minute grains of native gold. A portion of galena from the assorted and washed ore, which still retained an admixture of blende and pyrites, gave by assay 69 per cent. of lead and 32 ounces of silver to the ton of ore. Another sample of galena, more carefully dressed, gave at the rate of 37 ounces of silver. The button of silver obtained by cupellation from this lead contained a small but appreciable quantity of gold. The assay of a second portion of the sample of ore, which yielded 69 per cent. of lead, afforded by cupellation a quantity of silver equal to not less than 256 ounces of silver to the ton. This result was probably due to the presence of a fragment of native silver, or some rich silver ore among the dressed galena; inasmuch as a third assay, of another portion of the ore, more carefully dressed than the first, yielded 37 ounces of silver to the ton. The silver from the cupellation of the reduced lead contained a little gold, and both silver and gold were obtained from the blende and pyrites of the same vein. 1000 grs. of the

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pyrites, still mingled with a small portion of the other ores, were roasted, and then fused with litharge, borax, salt of tartar and metallic iron. The resulting button of lead gave by cupellation, 0.15 grs. of an alloy of gold and silver. 700 grs. of the blende, treated in the same manner, gave 0.19 grs. of a similar alloy of a pale yellow colour. The two precious metals seem thus to be generally disseminated throughout the ores of this vein."*

There can be little doubt, from the known presence of gold in some veins, of its existence in most. Dr. Anderson obtained gold from a small fragment chipped off a quartz boulder at St. Mary. The success which has attended quartz crushing in Nova Scotia will probably give an immediate impulse to that branch of gold mining here, and we may, therefore, expect that during the coming summer the contents of some of the countless veins, with which the face of the whole region is reticulated, will be exposed. Should they prove to be as richly charged with gold as those of the Lower Province, the discovery will most likely result in the general abandonment of alluvial diggings in favor of that more constant and certain source of profit.

The gold-bearing veins appear among rocks of both the Upper and Lower Silurian groups, which merge gradually into one another in the midst of the gold regions of the Chaudière—the Quebec group giving place to Upper Silurian slates between the Guillaume and St. François church. The geological features of the Chaudière are described in the recent report of the geological survey, page 427, condensed from the annual report of 1849-'50.

But gold is not confined to the Chaudière valley. It will, probably, be found over the whole extent of the Quebec group of rocks, which stretches, with certain undulations, from Missisquoi Bay to Newfoundland. A specimen, weighing several dwts. was brought up lately from Trois Saumons; and gold is found in the Magog and St. Francis rivers, and in streams in Westbury, Weedon, Ascot and Dudswell, and on Lake St. Francis. As already stated, gold was long ago detected in a copper-bearing vein in Ascot, near Sherbrooke;

* Geological Report for the year 1853, and General Report, page 517.

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and very beautiful specimens, weighing several pennyweights, have been taken from a vein of bitter spar on lot No. 14, 14th range, in Leeds, near Harvey Hill, which carries likewise copper-glance and specular iron ore. The same measure is supposed by Mr. Herbert Williams, the mining superintendent of the English and Canadian Mining Company, to crop out in the Handkerchief Peak, St. Sylvester, the property of the Chaudière Copper Mining Company, where the prospects of gold are favourable.

It is yet an open question whether, after all, the Canadian gold fields are to be a source of wealth to the province, or only a subject of curious enquiry to the geologist and mineralogist. For nearly twenty years it has been a well-known fact that gold exists, in considerable quantities, within fifty miles of our city, and with the object of finding it the auriferous region has been over and over again explored. But had not the fortunate discovery of a single rich deposit created an unwonted excitement, they might have remained as long again of as little general interest as the gold mines of Transylvania or the Ural Mountains. That Canada is another California is more than improbable; that its alluvial diggings will become as famous as those of Virginia and the Carolinas, is possible. In Virginia, as much as $10,000 has been taken from a spot twenty-five feet square. Nothing yet done here can compare with that. The gold mines of the Southern States sent annually to the United States mint one million dollars of gold.

As there will, probably be a rush to the Chaudière next summer and Rodrigue's mines being well-nigh exhausted, the crowd will be driven to search elsewhere, the question may be solved. Next summer, in all likelihood, the quartz mines will also be fully tested, and we shall be able to draw comparisons with Nova Scotia. There is perhaps hardly identity enough between the Nova Scotian gold bearing group and the Quebec group to excite any very sanguine expectations. It is, however, a hopeful sign that there is some affinity between the rock at Cape Canseau and the upper slates which are intersected by some of the quartz veins of the Chaudière.

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Unless the quartz veins do prove productive, the gold will hardly ever become directly a source of revenue to the province, owing to the extreme difficulty there will be found of enforcing any system of licenses. To keep on foot a body of police and officials, numerous enough to watch so wide a district, covered over almost its whole extent by dense forests, would cost a hundred fold more than the sale of licenses would ever bring in. And the same difficulty would attend the sale of locations. Once, however, quartz crushing-mills are established, a royalty may be levied without any expense to government, and with as little dissatisfaction as the tax has excited in Nova Scotia. Should the gold fields not prove rich enough to attract single-handed labour, but should capitalists deem it worth while to work on a large scale, the case would, of course, be different.

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Paper IV.—NOTE ON AN INCIDENT OF EARLY CANADIAN HISTORY.

By JOHN LANGTON, Esq.

(Read before the Society, Wednesday, 16th December, 1863.)

In my opening address at the commencement of the present session, I spoke of the numerous discrepancies in the details of almost all events in Roman history, as they are handed down to us, and I expressed an opinion that the modern critics lay far too much stress upon these, as throwing a suspicion upon the general authenticity of the narrative. As an illustration of the very various versions, which may be given by different historians, of an event, the authenticity of which is, nevertheless, perfectly undoubted, I propose to call your attention to one of the earliest incidents in Canadian history, of which hardly any two authors give the same account, whilst we know all the circumstances connected with it upon the very best authority, that of the chief actor himself. The incident in question is Champlain's expedition in 1615, in which he first visited the great lakes, and by which civilized man became acquainted with what is now Upper Canada. The discovery led, indeed, to nothing at the time, as it was not till a full half-century afterwards that the French obtained any permanent footing in the upper country; but it had, nevertheless, some very important consequences. It was in his company, on that occasion, that the Recollet Fathers first penetrated to the country of the Hurons, and paved the way for those missions whose fate forms such an interesting episode in our early annals; and the unprovoked attack upon the Iroquois, which formed the excuse for the expedition, was the forerunner of those devastating Indian wars, which cramped the energies of the French colonists during more than a century, and engendered a hostility which was never thoroughly allayed, as long as their rule existed on this continent.

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It is a remarkable expedition, moreover, from its boldness, and as being the first example of that spirit of restless enterprize which was characteristic of the French system of colonization, and which presents such a strong contrast to the slow and cautious advances of the early English settlements. To me it has always been especially interesting, as Champlain's route lay through that part of the country where I, more than two centuries later, was one of the first European settlers.

Champlain's narrative is clear and unmistakeable, as all his geographical descriptions are, and if we could misunderstand his words, his map, distorted and imperfect as it is, would leave no doubt as to his route. The Iroquois village which he attacked is laid down on it, and his course is indicated by references to explanatory notes which accompany the map. He started from Montreal, ascended the Ottawa, crossed over by Lake Nipissing and French River to Lake Huron, and then turning to the east, he coasted along till he reached the Huron settlements, between Matchedash Bay and Lake Simcoe. He remained some time at the principal village, whilst his Huron allies were collecting their forces. He calls it Cahiagué, a name which does not subsequently occur amongst the numerous villages in that confined peninsula, with which the narratives of the Jesuits make us familiar, and the sites of most of which have clearly been identified, during the last two or three years, by my friend Dr. Taché; but there can be little doubt that it is the same as that subsequently called St. Jean Baptiste by the French, which was situated somewhere in the township of Orillia. Carrying their canoes overland to the narrows, they then crossed Lake Simcoe, made the portage to Balsam Lake, and thence through that chain of lakes, which are the scene of some of my pleasantest recollections, they followed the course of the Otonabee and Trent, and emerged into Lake Ontario by the Bay of Quinté. Passing round the lower extremity of Lake Ontario, they landed, and after a four days' march through the woods, in which they crossed the Oswego River, where it falls out of Lake Oneida, they reached the Iroquois village which was

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the object of their attack, near Onondaga Lake; the site of which is identified by Brodhead with the present town of Liverpool. Being repulsed, they retreated by the same route by which they descended, and Champlain, being unable to obtain guides to take him down the St. Lawrence, returned with them, and found his way to Quebec the next spring by the old portages at Lake Nipissing.

There is only one difficulty with regard to the route, viz., that Champlain mentions five portages below Balsam Lake, some of which, he says, are of four or five leagues, whereas there is only one considerable carrying place of about seven miles. This may have arisen from their not following the main stream, but passing through the Lakes of Belmont and Marmora, and so entering the Trent by Crow River; a supposition which is rather strengthened by the fact, that the large lake on which they encamped on their return until the ice had formed, and which is clearly Rice Lake, is not mentioned, as if they had already become acquainted with it in descending. The exaggerated length of the portages, however, is no serious objection, as this always occurs in such descriptions—that from Lake Simcoe to Balsam Lake, for instance, being called ten leagues by Champlain, whilst it is really only about fourteen miles. This will not be very surprising to any one who has carried a canoe or a heavy pack through the woods, under which circumstances a mile assumes very formidable proportions. I myself used to frequent a place in those same waters, which was always called and believed to be the three mile portage, but which, having been of late years included in a surveyed township, is found by admeasurement to be somewhat less than a mile and a quarter. These, however, are unimportant details. As to the main course of his journey there can be no doubt; but the most contradictory accounts of it are given by almost all succeeding historians, and I have found none who relate it correctly, except Brodhead in his history of New York, before mentioned.

The first edition of Lescarbot, published in 1611, cannot, of course, contain any notice of an occurrence in 1615, but it does mention a mythical expedition to Lake Ontario as having been

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made in 1610, which might easily be confounded with it. This account Lescarbot professes to have had from the lips of Champlain himself, who told him that he had ascended the St. Lawrence above Sault St. Louis (Lachine Rapids) and fought a battle on a great lake ninety leagues long. Now, Champlain had certainly never seen Lake Ontario at that date, though he had heard of its existence, and in his map, published in 1613, he indicates this large lake, and appears to have made the curious mistake of placing the great fall, of which he had heard, at its outlet instead of at its inlet. Lescarbot, no doubt, mixed up his account of the real skirmish with the Iroquois on Lake Champlain in that year, with the rumors of a great lake above the St. Lawrence. In his third edition, published in 1618, Lescarbot brings down the history of Canada to 1615, but he makes no mention of Champlain's journey.

Sagard ought to have known all about it, for he was a missionary amongst the Hurons only eight years afterwards, and he had then, as a companion, Father Joseph Caron, who had formed part of Champlain's original expedition. He does indeed mention, in his History of Canada, that Caron had spent the winter of 1615–16 amongst the Hurons; but Caron cannot have been very communicative, for he adds : "*De la façon qu'il fut traicté en son voyage, et reçu dans le païs, ie ne scay pas les particularitez pour ne m'y estre pas trouvé.*" But as to Champlain, he not only does not mention his warlike expedition, which, perhaps, was not in his line, but he does not even allude to him as having been amongst the Hurons along with Caron.

Lalemant also should have been well informed, as he was the head of the Huron Mission, some years later; but in speaking of the establishment of the Mission at St. Jean Baptiste (Champlain's Cahiagué), in the year 1839-40, he says that this was the place where Champlain principally resided when there twenty-two years before, thus misdating the expedition by two or three years.

Ducreux is more the historian of the Jesuit Missions than of Canada, and he only commences his regular history in 1625, and does not notice any of Champlain's earlier adventures.

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La Potherie enters into some detail with respect to Champlain's two first forays against the Iroquois, when he approached them by the Richelieu River, in company with the Algonquins and Montagnets; but he makes no mention of the last, and much the most important one, in which the Hurons were his allies.

Cadwallader Colden, in his History of the Five Nations of Canada, is equally silent about the last expedition, though he too mentions the two former ones.

The Abbé Raynal, Jeffrey, and Wm. Smith follow the same course, mentioning only the two earlier expeditions.

Charlevoix speaks of it, and comments severely upon the policy of the undertaking itself, and upon the manner in which it was carried out; but he gives no indication of the direction followed, and merely says that having collected their forces amongst the Hurons, they marched against the enemy. In this he is followed by many later writers, as Bidaud, Boyd, W. H. Smith, and Warburton, most of whom even leave it in doubt as to where the expedition rendezvoused.

As to the rest of the historians, the more they enter into particulars, the more they go astray. Garneau places Cahiagué on Lake Ontario, and applies Champlain's name of Mer Douce to that lake, instead of to Lake Huron; and he says that they had only to cross the St. Lawrence in latitude 43° in order to reach the enemy. It would not be easy to see what the latitude has got to do with the matter, as Ontario lies, through its whole length, almost in the direction of a parallel of latitude, but altogether to the north of 43°. The fact is that Champlain, who never saw anything of the lake except its outlet into the St. Lawrence, places that in latitude 43°—in which he is mistaken; but the use of introducing the latitude is obvious in his case, but quite purposeless in Garneau, even if it were correct, as it would not at all assist in fixing the locality. Moreover, Garneau makes Champlain spend the winter south of Lake Ontario, amongst the Neuters; whilst we know that he never visited the Neuters at all, and that they did not live south of Lake Ontario, but in the western peninsula of

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Canada, having only one or two outlying villages across the Niagara river.

Roger makes Champlain find the Iroquois on Lake Huron, and says that he returned to Quebec by way of Lake Ontario.

Miss Roy says he collected his allies somewhere near Green Bay, on Lake Michigan, and supposes that the Iroquois fort, which he attacked, was on the Georgian Bay.

McMullen makes Cahiagué at the extremity of Lake Huron, and says that they proceeded thence through Lake St. Clair, and attacked the Iroquois near where Detroit now stands.

Murray, in his "British North America," introduces the most beautiful confusion. He calls the allies Algonquins, and not Hurons; and after giving a very detailed account of their collecting at Cahiagué, and their proceedings there, he makes them go down a chain of small lakes, not to Lake Ontario, but to Lake Huron; and after quitting Lake Huron, he says that they struck into the interior to a lake, which he supposes to be Lake George—evidently mixing this expedition up with that six years before in 1609, in which they did defeat the Iroquois on Lake George, having reached it by Lake Champlain.

But the most astonishing perversion of the story occurs in a state paper, of which we have a copy in our own MS. collection. It is a Mémoire, prepared by the Marquis of Dénonville, Governor General of Canada, and signed by Louis XIV. himself, and countersigned by Colbert. It bears date May 16, 1688, and its object is to shew the prior claim of France to the whole country of the great lakes. After setting forth Champlain's previous discoveries, it proceeds thus: "Et en l'année 1611 et 1612, il monta par la grande rivière jusqu'au lac Huron, qu'on appelle la Mer Douce; de là il fut à la nation du Petun, puis à la nation Neutre, et à celle des Mascoutins, qui demeuraient alors vers l'endroit qu'on appelle Sakiman. De cet endroit il alla vers (*avec*) les sauvages Algonquins et Hurons, en guerre contre les Iroquois. Il passa par des lieux qu'il a décrits lui-même dans son livre, qui ne sont autres que le Détroit, et le lac Erié." And later on in the same document,

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it is said that Joliet and Marquet had taken formal possession of Lake Erie, "pour renouveller les prises de possession du Sr. de Champlain en 1612."

Now, if one may be allowed to contradict such great persons as Louis XIV and Colbert, I should say that they can either never have read Champlain, or they must have read him very carelessly, for there is hardly a statement in the passage quoted which is not incorrect. In 1611 Champlain sailed for Europe, about two months after he broke up his winter quarters at Quebec, and never ascended the river higher than Montreal; and in 1612 he never was in Canada at all. But even if we amend the date to 1615, the details are equally untrue. He did certainly (*after* his return from the Iroquois) visit the Petuns during the winter, who lived in the northern parts of the present counties of Grey and Bruce, and he mentions the Neuters as living further south, but he expressly says that he was dissuaded from visiting them. As to the Mascoutins, whom he had heard of under their Huron name of Asistagueronon or *Nation du feu*, they lived on Lake Michigan, of which he knew so little, that in his map, published seventeen years later, he makes it stretch away to the north, instead of to the south, of Lake Huron. Neither did he ever see Detroit or Lake Erie, and it is doubtful if he knew of the existence of the latter even by report, for in his map in 1632, he merely connects Lakes Huron and Ontario by a river.* The first certain

* In the note on the ancient geography of Canada, in the appendix to the Rev. P. Martin's translation of Bressani's Relation (Montreal, 1852), Champlain is quoted as an authority for the name *Lac Derié*. If the name occurs in his book, it has escaped me; it certainly is not to be found in his map. I suspect the compilers of that useful appendix have obtained the name, with that spelling, from the map of 1613, which professes to be *recuillie et dressés sur diverses relations modernes*. In the configuration of the country it is an exact copy of Champlain's map, but it contains some half a dozen new names, indicating increased geographical knowledge, and amongst them *Lac Derié* under the river which occupies its place. It must be from this map also, and not from Champlain's as quoted, that the compilers obtained the name *Kaoutotun* for the great Manitoulin Island.

From about 1640 Lake Erie was well known, though lying out of the usual track, and it is not very unfaithfully represented by Sanson in 1657, and by Ducreux in 1660; but there is, in the Parliamentary Library, a map of as late a date as 1664, said to contain *les terres nouvellement découvertes suivant les mémoires du P. du Val*, in which Lake Erie does not appear even by name; and

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account we have of any one having visited the Neuters is the letter of De la Roche Daillon, in 1626, published in Sagard's History. As to Lake Erie, it appears doubtful whether even in 1640 Le Jeune knew of its existence, for he gives a description of the whole lake region, including Lake Superior, without any allusion to it. The first clear account which we have of it is in Lalemant's Relation of 1641, and the first journey through it, of which I have found any mention, is that of two missionaries named Dolier and Galinée, as late as 1670.

When I was examining into the manner in which the probability of ancient Roman history is tested by its internal evidences, I could not help being struck with the uncertainty which would rest upon this accident in our own early annals, if Champlain's original journal had not been preserved. The ominous silence of most of the earlier historians would be held to throw a doubt upon there having ever been any such expedition at all; and the irreconcilable differences in all those who enter into any detail, would appear incompatible with there having been any authentic record to refer to. The special object which the French authorities had in putting forth their version, would appear very suspicious, and would be held, and very justly so, to indicate that the story had been got up to meet the requirements of their policy. And Brodhead's narrative, the only true one, from its giving minute particulars not mentioned elsewhere, and from its divergence from all other accounts, would probably have been looked upon as a pure fabrication of a later age.

Hennepin, in 1682, says that its western extension (which existed only in imagination) had never been explored.

I will take this opportunity of correcting another error in the appendix to Martin's Bressani. *Lacus Ouëntaronius* is given as one of the names of Ontario on the authority of Ducreux; but Ducreux, in the body of his map, calls it *Lacus Ontarius*, and the *Ouëntaronius* in the enlarged "Chorographia Regionis Huronum," in the margin, is evidently Lake Simcoe, which was known by that name (Wentaronk) down to the time of Governor Simcoe.

Note.—It should have been stated in the text that the details of Champlain's expedition are given in the Abbé Ferland's *Cours d'Histoire*, with the accuracy which distinguishes every thing in that admirable work; but I think that he is mistaken in adopting Dr. O'Callaghan's identification of the locality of the Iroquois fort.

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PAPER V.—LIST OF COLEOPTERA AND DIPTERA TAKEN AT QUEBEC, AND OTHER PARTS OF LOWER CANADA.

By WILLIAM COUPER,

Cor. Mem. Ent. Soc., Philad.; Nat. Hist. Soc., Montreal; Assistant Sec. Lit. & Hist. Soc., Quebec.

[Presented to the Society 6th January, 1864.]

COLEOPTERA.

The species with an * occur also in the vicinity of Toronto, Upper Canada. Those described under genera, without specific names, do not appear in Melsheimer's or LeConte's catalogues, and are, therefore, supposed to be either obscure forms described by old authors or at present unknown to American entomologists. The species to which *n. s.* is attached are new.

CICINDELA *Linn.*

longilabris *Say.* albilabris *Kirby.* Taken at Lorette. June.

*sexguttata *Fabr.* violacea *Fabr.* In the woods. July.

*vulgaris *Say.* obliquata *Dej.* tranquebarica *Herbst.* Common.

*duodecimguttata *Dej.* proteus *Kirby.* Quebec. August. Sandy roads.

hirticollis *Say.* albohirta *Dej.* unita *Kollar.* gravida *Lec.* Common on sandy roads in August.

LORICERA *Latr.*

*pilicornis *Latr.* Carab. pilicornis *Fabr.* In woods. July. Rare.

NEBRIA *Latr.*

castenipes *Lec.* Helobia cast. *Kirby.* Under stones near woodland brooks. June and July.

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CALOSOMA *Fabr.*

*calidum *Fabr.* In fields. July and August. Common.

*frigidum *Lec.* St. Louis road. Very rare. I have taken numerous specimens of this insect on the island opposite Toronto.

CARABUS *Linn.*

serratus *Say.* lineatopunctatus *Dej.* In fields, under stones. July. Common.

Lapilayi *Laporte.* Under stones, &c. June and July. Uncommon.

BRACHINUS *Weber.*

fumans Fabr. librator. *Dej.* Quebec. Attracted by candle light. July. Very rare.

LEBIA *Latr.*

*viridis *Say.; Dej.* Taken on flowers. July.

pumila *Dej.* floricola *Harris.* On flowers. Uncommon.

CYMINDIS *Latr.*

reflexa *Lec.* Uncommon.

CALATHUS *Bon.*

gregarius *Dej.* Feronia greg. *Say.* Rare.

PLATYNUS *Bon.*

picipennis *Lec.* Agonum pic. *Kirby.* Rare.

pusillus *Lec.* Anchus pusillus *Lec.* Rare.

sinuatus *Lec.* Anchomenus sin. *Dej.* Under bark of trees during summer.

chalceus *Lec.* Agonum chalceus *Dej.* Under stones. Uncommon.

*cupripennis *Lec.* Agon. cupr. *Dej.* Feronia cupr. *Say.* Com.

*octopunctatus *Lec.* Carabus oct. *Fabr.* Feronia oct. *Say.* Agonum oct. *Dej.* In fields. Uncommon.

placidus *Lec.* Feronia pl. *Say.* Ag. morosum *Dej.* Common.

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PTEROSTICHUS *Bon.*

*lucublandus *Lec.* Pœc. lucublandus *Kirby.* (See LeConte's Catalogue for synonyms.) Common. It forms the second section Pœcilus *Bon.* under this family.

stygicus *Lec.* Feronia styg. *Say.* Fer. bisigillata *Harris.* Omaseus rugicollis *Hald.* Under leaves in woods. Common.

*luczotii *Lec.* Fer. lucz. *Dej.* Fer. oblongonotata *Say.* Race *a* sexpunctatus (*Mann.*) Pl. obtusangula *Motsch.*

I have given the synonyms of this species, together with the form sexpunctatus (*Mann.*) which is considered as a race. It occurs rather common in fields near Quebec, and also at Owen Sound, U. C. I have not met with it at Toronto. It is placed by LeConte under Platysma *Bon.*, the eighth section of the family.

AMARA *Bon.*

impuncticollis *Say.* Am. anthracina *Hald.* Am. difficillis *Lec.* Am. brunnipes *Motsch.* Uncommon. July.

The following species is an addition to our fauna:—

Black, glossy, without dorsal punctures Three first joints of antennæ rufous, the remaining eight black: Elytra with eight striæ on each, and an abbreviated one on each side the scutellum: tibiæ tinged with rufous. Length $\frac{5}{13}$ inch. Quebec. Uncommon.

CHLÆNIUS *Bon.*

*sericeus *Say.* Car. ser. *Forster.* var. Chl. perviridis *Lec.* Com.

*tricolor *Dej.* Common during summer.

ANISODACTYLUS *Dej.*

ellipticus *Lec.* Common. This insect is placed under the second section Triplectrus *Lec.*

HARPALUS *Latr.*

herbivagus *Say.* Ophonus mutabilis *Hald.* var. H. proximus *Lec.* The two varieties are common at Quebec.

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viridiaeneus *Beauv.* viridis *Say.* assimilis *Dej.* Two varieties of this insect occurs commonly at Quebec.

STENOLOPHUS *Dej.*

humilis *Dej.* This species is placed by Le Conte under the second section Acupalpus *Dej.*

HALIPLUS *Latr.*

immaculicollis *Harris.* Americanus *Aubé.* Common in ponds in the neighborhood of Quebec.

Of this genus I have also two species taken in company with the above. Both are twice the size of "immaculicollis." The largest has the thorax yellow with a transverse oval black spot on the anterior margin behind the eyes.—The elytra are closely punctured, and possess the characteristic markings of the genus. The thorax of the other is yellow, but with a central black circular punctured spot on each side of the posterior margin, and the latter within the spots is also black. In this species the elytra are more coarsely, but less densely punctured.

LACCOPHILUS *Leach.*

maculosus *Say.* Dytiscus mac. *Germ.* Common in ponds during the summer.

ANISOMERA *Aubé.*

Two species from the neighborhood of Quebec are new to our insect fauna. I describe them in detail.

1. *Body* depressed, black, glossy, with minute scattered punctures: *scutellum* small triangular: *antennæ*, *palpi* *legs* and front of *head* of a dark chestnut color: anterior *tibiæ* spined: *tarsi* with ungues. Length ⅓ inch. Quebec, in ponds. Uncommon.

2. Depressed, black, but not so polished as the former: *Antennæ* *palpi*, *legs* and anterior margin of *elytra* dark chestnut. The *tibiæ* are spined, and the anterior *tarsi* provided with ungues. Length ¼ inch. Quebec, in ponds. Uncommon.

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COLYMBETES *Clairv.*

***biguttulus** *Lec.* Dytiscus big. *Germ.* Ilybius fenestralis *Aubé* var. Il. pleuriticus *Lec.* Common in ponds during summer.

quadrimaculatus (*Aubé*). In ponds, but not frequent.

ACILIUS *Leach.*

fraternus *Lec.* Dytiscus frat. *Harris.* Ac. semisulcatus *Aubé.* In ponds. Uncommon. August.

The ♀ has four finely granulated grooves occupying longitudinally the third part of elytra. Each groove shortens anteriorly towards the suture.

HYDROCHARIS *Latr.*

obtusatus *Lec.* Hydrophilus ob. *Say.* Ponds. Uncommon.

NECROPHORUS *Fabr.*

Melsheimeri *Kirby.* Very rare.

mortuorum *Fabr.* pygmæus *Kirby.* crispetus *Motsch.* Occasional during summer.

***velutinus** *Fabr.* tomentosus *Weber.* This is also an occasional species.

NECRODES *Wilkin.*

***surinamensis** *Fabr.* Common.

THANATOPHILUS *Leach.*

***lapponica** *Herbst.* caudata *Say.* tuberculata *Germ.* granigera *Chev.* Common.

***marginalis** *Fabr.* noveboracensis *Forster.* Common.

NECROPHILA *Kirby.*

***peltata** *Lec.* scarabaeus pelt. *Catesby.* Silpha americana *Linn.*
var. Oiceoptoma terminatum *Kirby.*
var. O. affine *Kirby.*
var. O. Canadense *Kirby.*

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CREOPHILUS *Stephens.*

*villosus *Kirby.* Staphylinus vill. *Grav.* Uncommon.

LEIŞTOTROPHUS *Perty.*

*cingulatus *Kraatz.* Staphylinus cing. *Grav.* S. chrysurus *Kirby.* S. speciosus *Mann.* Rare.

Three species taken during last summer are still undetermined. The following descriptions may, in the meantime, serve to rank them as additions to our insect fauna :—

Maxillary palpi composed of three joints, the third moderately elongate : *antennæ* inserted at the anterior margin in front inside the mandibles, not strongly geniculate, 11-jointed : *head* as wide as thorax, flattened, densely punctured : *eyes* not elevated : *thorax* densely punctured.

They evidently belong to LeConte's Third sub-tribe XANTHOLINUS.

1. Black ; antennæ ferruginous ; femora, tibia and tarsi rufous. A smooth line from the anterior centre of the head, widening and elevated at the end of thorax, the latter with three large punctures on the margin : scutellum concave, margin smooth : abdomen margined, composed of six rings. Length ½ inch. Quebec. Uncommon.
2. Head steel-blue, polished ; thorax purple, polished, with a longitudinal central smooth line : scutellum as in the former ; Elytra same color as thorax, but the sutural margins are smooth, having a stria on each : anterior rings of abdomen pubescent at margins ; apex steel-blue, beneath punctured. Length $\frac{9}{16}$ inch. Quebec. Very rare.
3. Maxillary palpi rufous : antennæ, head and thorax dark rufous, the latter with a smooth longitudinal central line : scutellum black, margined and of same form as that last described : Elytra bright rufous, the sutural margins smooth and narrow : posterior margin of abdominal rings and the apex entirely rufous : tibiæ and tarsi rufous Length $\frac{9}{16}$ inch. Quebec. Very rare.

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LATHROBIUM *Grav.*

puncticolle *Kirby.* July and August. Rare.

CRYPTOBIUM *Mann.*

***bicolor** *Er.* Lathrobium bic. *Grav.* August.

PÆDERUS *Grav.*

***riparius** *Fabr.* Sometimes common. In U. Canada this species congregate at the roots of trees in the fall, when they enter cavities under the bark, &c., and remain during winter.

OXYPORUS *Fabr.*

rufipennis *Lec.* In fungi. This is a new species lately described by Mr. LeConte. His insect came from the Western States.

PLATYSOMA *Leach.*

***Lecontei** (*Mars.*) This genus forms the fourth section under the family HISTRINI. It is found beneath bark of decayed trees.

IPS *Fabr.*

***Dejeanii** *Kirby.* sepulcharlis *Randall.* Very common.

CUCUJUS *Fabr.*

***clavipes** *Fabr.* Under bark of trees. Rare

PEDIACUS *Shuckard.*

planus *Lec.* Sylvanus planus *Lec.* Under bark. Rare.

DERMESTES *Linn.*

***lardarius** *Linn.* Extremely common.

CYTILUS *Er.*

***varius** *Er.* Byrrhus varius *Fabr.* B. trivitattus *Mels.* var. B. alternatus *Say.* Common north of Beauport.

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BYRRHUS *Linn.*

Kirbyi *Lec.* Occurs at Cape Diamond behind the Citadel. Not common.

Two additional species occur in the vicinity of the city, which are not yet determined.

PLATYCERUS *Geoffr,*

*quercus *Sch.* Lucanus qu. *Weber.* Pl. securidans *Say.* Found at Lake St. Charles. August.

ONTHOPHAGUS *Latr.*

*latebrosus *Strum.* Scarab. hecate *Panzer.* Uncommon.

TEUCHESTES *Muls.*

fossor *Fabr.* Scarabaeus foss. *Linn.* Common.
*fimitarius *Ill.* Very common.

GEOTRUPES *Latr.*

egeriei *Germ.* Found in Agarics in woods. July. Rare.
*excrementi *Say.* Rare.

HOPLIA *Ill.*

*trifasciata *Say.* primaria *Burm.* helvola *Mels.* ♀ tristis *Mels.* Uncommon.

DICHELONYCHA *Kirby.*

*elongata *Fitch.* Melolontha elong. *Schonh.* Common in August.

PHYLLOPHAGA *Harris.*

*quercina *Kn.* *Harris* Ins. Very common.

SERICA *McLeay.*

*vespertina *Lec.* Melolontha vesp. *Schönh.* Omaloplia vesp. *Harris.* C. atricapilla *Kirby.* Very abundant in the woods in June and July.

OSMODERMA *Lep.*

*scabra *Dej.* Trichius sc. *Beauv.* ♂ Gymnodus foveatus *Kirby.*
♀ Gymnod. rugosus *Kirby.*

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TRICHIUS *Fabr.*

***piger** *Fabr.* Drummond *Gory.* rotundicollis *Kirby.* Common on flowers during midsummer.

DICERCA *Esch.*

***divaricata** *Lec.* Buprestis div. *Say.* August. Rare.

ANCYLOCHIRA *Esch.*

maculiventris *Lec.* Buprestis mac. *Say.* Bup. sexnotata *Lap.* August. Rare.

MELANOPHILA *Esch.*

***longipes** *Gory.* Buprestis long. *Say.* Ap. appendiculata *Lap.* Mel. immaculata *Gory.*

This species is very common during the latter part of July. It elevates the elytra somewhat similarly to Chrysobothris, and it is also difficult to capture. Some years ago, when the cabinet factory of Messrs Jacques & Hay of Toronto was being consumed by fire, which happened just as this insect was appearing in its perfect state, the heat from the flames, in addition to the warmth of the day, irritated them to an extraordinary degree. Their bite became so troublesome to the spectators that many had to leave the immediate vicinity. The bite of this insect, under such circumstances, is like dropping hot sealing wax on the skin.

CHRYSOBOTHRIS *Esch.*

quadreimpressa *Lap.* Taken on fences. August.

CRYPTOHYPNUS *Esch.*

abbreviatus *Lec.* El. silaceipes *Germ.*

ELATER *Linn.*

pedalis *Cand.* Ampedus ped. *Germ.* El. ursulus *Mels.* Common under bark of trees.

miniipennis *Lec.* Common.

rubricus *Say.* Ampedus conc. *Germ.* Rare.

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AGRIOTES *Esch.*

mancus *Lec.* Elater manc. *Say.* El. (Agr.) obesus *Harris.* Agr. truncatus *Mels.* Agr. striatulus *Mels.* August. Common.

fucosus *Lec.* var. collaris *Lec.* Very rare.

DOLOPIUS *Esch.*

pauper *Lec.* Uncommon.

MELANOTUS *Esch.*

decumanus *Er.* Uncommon.

sagittarius *Lec.* "

LIMONIUS *Esch.*

griseus *Cand.* Elater st. *Herbst.* El. armus *Say.* Gambrinus arm. *Lec.* Very common.

CORYMBITES *Latr.*

cylindriformis *Germ.* Elater cylind *Herbst.* El. appressifrons. *Say.* ♀ El. brevicornis *Say.* C. parallelopipedus *Germ.* Common.

æripennis *Lec.* El. (Aphotistus) aer. *Kirby.* El. appropinquans *Rand.* Under bark of dead trees.

pulcher *Lec.* Very rare.

tarsalis *Lec.* Athous tars. *Mels.* Uncommon.

pyrrhos *Lec.* Elater pyrrh. *Herbst.* ♀ Athous pyrrhicus *Hald.* Ath. vagrans. *Mels.* Ath. æqualis *Mels.* Rare.

ASAPHES *Kirby.*

decoloratus *Lec.* Elater dec. *Say.* Rare.

DICTYOPTERA *Latr.*

perfaceta *Say.* substriata *Lec.* Rare.

EROS *Newm.*

*coccinatus *Say.* Very rare. Found in pine swamps.

TELEPHORUS *Geoff.*

carolinus *Fabr.* Common. July.

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HYDNOCERA *Newm.*

curtipennis *Newm.* brachypterus *Kl.* lineaticollis *Spin.* Gomin woods. Rare.

NECROBIA *Latr.*

*violaceus *Fabr.* Found in dried bones, &c., during summer.

CURCULIO *Fabr.*

pinicola *n. s.*

Dusky; completely punctured and covered with golden decumbent hairs, some of which are transverse on the thorax. Occurs on pines near Quebec.

Body underneath black; the posterior section composed of three rings, the anterior one as wide as the two following. *Eyes* black, oval, transverse, a tuft of hair over each; in some specimens the space behind and beneath the eyes is without many hairs, and presents only a ferruginous glossy punctured appearance: *rostrum* of equal width throughout, punctured, ferruginous, the lateral groove oblique: *antennæ* composed of eight joints, (visible with the lens) the outer ones largely capitate; the first clavate, and almost as long as the other eight; the second joint is longer than the third, and the latter longer than the succeeding four which are equal; but the basal capitate joint is distinct: *Thorax* much narrower than anterior part of body, slightly swelled at the sides, having short longitudinal and lateral polished elevated spaces, and densely covered with golden hairs: *scutellum* black and slightly elevated: *Elytra* covers the abdomen, each with nine rows of long deep impressions, and covered with distinct patches of golden hairs: *femora* clubbed, indented underneath: *tibiæ* armed with a strong tooth at base: *tarsi* cushioned, and provided with *ungues*. Length ⅛ inch. Rare.

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I have named this weevil in accordance with the only habitat in which it is found. Another species of the same size occurs in Western Canada but with marked differences of elytral characters.

CRYOCEPHALUS *Muls.*

*rusticus *Linn.* obsoletum *Rand.* Common. July. Pine-borer.
agrestis *Kirby.* Common. Pine-borer.

CALLIDIUM *Fabr.*

*violaceum *Linn.* Common. Destructive to pines.

CLYTUS *Fabr.*

hamatus *Say.* Rare.
*undulatus *Say.* undatus *Kirby.* Sayi *Lap.* Common. Very destructive to fallen pines when the bark is allowed to remain on the tree.
longipes *Kirby.* Rare.

CYRTOPHORUS *Lec.*

verrucosus *Oliver.* July. Rare.

MONOHAMMUS *Latr.*

confusor *Kirby.* maculosus *Hald.* Common.

ANÆREA *Muls.*

calcarata *Say.* Very rare,

COMPSIDEA *Muls.*

*tridentata *Oliv.* Rare.

SAPERDA *Fabr.*

candida *Fabr.* bivittata *Say.* Very destructive to apple and pear trees in the neighborhood of Quebec.

DESMOCERUS *Serv.*

*cyaneus *Fabr.* palliatus *Forst.* Not common.

RHAGIUM *Fabr.*

*lineatum *Oliv.* In July. Under the bark of pine trees. Com.

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EVODINUS *Lec.*

*monticola *Rand.* Taken at Bay St. Catharines, mouth of River Saguenay.

ACMÆOPS *Lec.*

*proteus *Kirby.* Pachyta sublineata *Hald.* Common in lumber yards.

STRANGALIA *Serv.*

*zebrata *Fabr.* zebra *Oliv.* Very rare.

LEPTURA *Linn.*

*canadensis *Oliv.* ♂ tenuicornis *Hald.* Common.

erythroptera *Kirby.* cinnamoptera *Hald.* Rare.

*vittata *Oliv.* abbreviata *Germ.* semivittata *Kirby.* Uncommon.

*vagans *Oliv.* brevis *Kirby.* Common about lumber wharves.

atrata *Lec.* Found at Laval. Rare.

chrysocoma *Kirby.* Quebec. Common on flowers during midsummer.

montivagans *n.s.* Black; head and thorax pubescent; antennæ black, slightly ferruginous; body beneath glossy. Taken at Bay St. Catharines, mouth of River Saguenay. July.

The specific characters appear in the elytral markings which are well developed in the ♀ and are as follows:—On a yellowish ground, black dentated marks occupy the shoulders, and a longitudinal oval spot on each side the suture behind the region of the scutellum,—the centre has a wide, black, irregular band, reaching (in the males) the suture, and the apex black, toothed anteriorly. The elytra are prolonged, exhibiting a large triangular space for the scutellum, which is not elevated. Length of ♂ ⅝ and ♀ ½ inch.

I have failed to discover the tree in which it goes through its stages, however, its name is applicable to its occurrence so far on the mountain regions of the Saguenay.

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quebecensis *n. s.* Black; head and thorax densely and minutely punctured, the latter has a smooth, narrow, longitudinal line on its disc; labial palpi yellow: elytra densely and minutely punctured; anterior femoræ yellow beneath, black above,—2nd and 3rd yellow at the joint attached to the coxæ.

Quebec. Rare. Length of ♂ ¼ inch.

The ♀ of the above have the same characters excepting that the whole of the tibiæ and tarsi are yellow.

DONACIA *Fabr.*

juncina *n. s.* *Head* black, minutely punctured, with a short cavity between the eyes: *thorax* violet, punctured, with a longitudinal impressed centre, and the anterior angles tuberculate: *Elytra* violet, densely punctured in rows, having four central depressions: body and legs sparsely covered with white hairs. Length over ¼ inch. Lake St. Charles, common.

GALERUCA *Geoffr.*

guttulata *Lec.* Common in July.

SYSTENA *Chevr.*

frontalis *Fabr.* Common.

CALLIGRAPHA *Chevr.*

Philadelphica *Linn.* Common.
*multipunctata *Say.* Common.

CHRYSOMELA *Linn.*

*elegans *Rogers.* Common.

EUMOLPUS *Fabr.*

*auratus *Fabr.* Gregarious on Dogbane.

GASTROPHYSA *Chevr.*

*caeruleipennis *Say.* polygoni *Linn.* Common during midsummer.

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HIPPODAMIA *Muls.*

Lecontii *Muls.* On thorn hedges. July. Rare.
*13-punctata *Linn.* tibialis *Say.* Common.
*parenthesis *Say.* tridens *Kirby.* Common.

COCCINELLA *Linn.*

lacustris *Lec.* tricuspis *Kirby.* On thorn hedges. Rare.
*novemnotata *Herbst.* Common.
transversoguttata *Falderm.* 5-notata *Kirby.* Common.
*bipunctata *Linn.* bioculata *Say.* Common.

MYSIA *Muls.*

*15-punctata *Oliv.* mali *Say.* Uncommon.

CHILOCORUS *Leach.*

*bivulnerus *Muls.* Common.

HELODES *Payk.*

modesta Lec. var. rare.

PENTHES *Fabr.*

obliquata *Fabr.* Not common. It is found under the bark of dead trees.

TENEBRIO *Linn.*

*molitor *Linn.* Common.

UPIS *Fabr.*

*ceramboides *Linn.* reticulatus *Say.* Common under the bark of dead trees.

BOLITOPHAGUS *Fabr.*

*cornutus *Pz.* Found in boleti growing on trees.

PHELLOPSIS *Lec.*

obcordatus *Kirby.* Common in fungi.

MELANDRYA *Fabr.*

striata *Say.* thoracica *Mels.* var. *a.* bicolor *Mels.* var. *b*

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EMMESA *Newm.*

connectens *Newm.* Rare.

DIRCAEA *Fabr.*

4-maculatus *Say.* Very rare.

MELOE *Linn.*

angusticollis *Say.* Common on the potatoe vines.

EPICAUTA *Redtenbacher.*

*atrata *Fabr.* pensylvanica *Geer.* nigra *Woodhouse.* Very common.

LIST OF DIPTERA.

Last summer, I collected Dipterous insects for the purpose of forwarding duplicates to Baron R. Osten Sacken of the Russian Legation in Washington, the only authority regarding this class of insects on the continent, who has kindly named many of them for me. The species that could not be determined were sent to Dr. H. Leow, Meseritz, Prussia, the highest living authority in Europe. The Baron states that "American Dipterology is not advanced enough as yet to make it possible" to determine all the species taken in this latitude. He says: "The *Muscidæ calypteræ* especially are in very bad condition, and will probably remain so for a very long time." In his last letter he adds: "If you can collect diptera, or if you are in a position to encourage others to do so, you will render a service to science. We want materials, especially from your Northern regions."

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The following is the first dipterological list published in this Province :

TIPULA *Linn.*

abdominalis *Say.* albilatus *Walk..* Common on the Gomin road during midsummer.

GERANOMYIA *O. Sacken.*

rostrata *Say.* Taken in the sweep-net. Gomin Road.

RHYPHUS *Latr.*

penestralis *Scop.* Taken in woods Gomin road.

LEPTIS *Fabr.*

Boscii *Macq.* In the woods on St. Louis road.
proxima *Walker.* Taken at Beauport.

TETANOCERA *Dumer.*

valida *Lw.*
combinata *Lw.*
plumosa *Lw.* In woods north of Quebec.

SARGUS *Fabr.*

viridis *Say.* Beauport. Common.

TABANUS *Linn.*

lasiopthalmus *Macq.?* Very common in July.

BOMBYLIUS *Linn.*

fratellus *Wied.* Common in sandy places in woods.

LAPHRIA *Fabr.*

posticata *Say.* In Gomin woods.

ANTHRAX *Linn.*

fulvianus *Say.* On flowers in the woods.

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MERODON *Latr.*

curvipes *Wied.* Polydonta bicolor *Macq.* Lower St. Lawrence

SYRPHUS *Linn.*

quadratus *Say.* Near the Montmorenci river.

ERISTALIS *Latr.*

dimidiatus *Wied.* Common on flowers in July.
Bastardii *Macq.* On flowers.

LAUXANIA *Latr.*

lupulina *Fabr.* Taken abundantly in the sweep-net.
cylindricornis *Fabr.* do. do.

TRYPETA *Meig.*

sparsa *Weid.* Taken commonly in the sweep net.

SCATOPHAGA *Latr.*

stercoraria *Linn.* Common everywhere.

DOLICHOPUS *Latr.*

cuprinus *Wied.* Very common.

TACHINA *Fabr.*

vivida *Harris.* (vid. T. hirta *Drury.*) Rare.

CONOPS *Linn.*

sagittarius *Say.* ? On flowers. Rare.

CORDYLURA *Fall.*

bimaculata *Lw.* Not common. Found on flowers.

VOLUCELLA *Geoffr.*

basalis *Say.* (Harr. coll.) "It is very like the European Volucella plumata"—O. S. In August. Common.

SYRITTA *St. Fargeau.*

pipiens *Linn.* Common on flowers. July.

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Although the list of diptera is small, I have still the hope of seeing a large addition made to it next summer, and I anxiously await the result of Dr. Leow's investigation of forms sent by me from this locality. The Canadian student of Diptera is strongly recommended to collect the following families, as it is probable that many of our species are new :—Tipulidæ; Tabanidæ; Dexidæ; Sarcophidæ; Myopidæ; Stratiomydæ; Adontomyina; Trypetidæ; Asilidæ; Tachinina.

Many Dipterous insects form galls or excrescences on various trees—the food of the larvæ being of vegetable character. It would therefore be conducive to natural science that such vegetable forms be collected for the purpose of discovering the insect architect. Two new galls were discovered in the vicinity of Quebec last summer—one a pretty leaf-gall of *Spiræa salicifolia*, the product of a *cecidomyia*, discovered by myself. The other an Aphis gall on White Spruce, discovered by the Rev. Mr. Brunett of Laval University. The writer would thankfully receive contributions of this nature.

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Paper VI.—MOTIONS OF THE TOP, TEETOTUM, AND GYROSCOPE.

By LIEUTENANT E. D. ASHE, R.N., F.R.A.S.

(Read before the Society, January 6th, 1864.)

Before entering into a description of the experiments upon the Gyroscope, Top, and Teetotum, and offering a solution of their motions under varying circumstances, I will just answer this question, viz.: What will be the consequence of removing all other atoms excepting those of which the top is composed, from the sphere BCQ, which is supposed to be rotating round the axis AB? (*Fig.* 1.)

The effect will be exactly the same as if all the atoms of the rotating sphere remained in their places, and an additional weight, equal to that of the top, were applied as a force passing through G, perpendicular to the horizon; a force that tends to turn the sphere round the horizontal axis AC. As no one atom drags another, but each atom has a motion corresponding to its position in the sphere, and the force acting upon it, it is evident that we may either take away the atoms of a corresponding top G', from the opposite hemisphere, or we may double the weight of the top.

The number and position of the atoms uncompensated will in either case be the same.

Therefore, under these circumstances, we are allowed to consider the top, teetotum, or gyroscope, as part of a sphere, which is revolving around a common axis, with a similar figure of revolution to the top, teetotum, or gyroscope, taken away from the opposite hemisphere.

It must be thoroughly understood that I consider the revolving body to be a part of a sphere, the point upon which the top, teetotum or gyroscope spins, to be the centre of that sphere, with a similar figure to the revolving body taken away from the opposite hemisphere.

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Fig. I

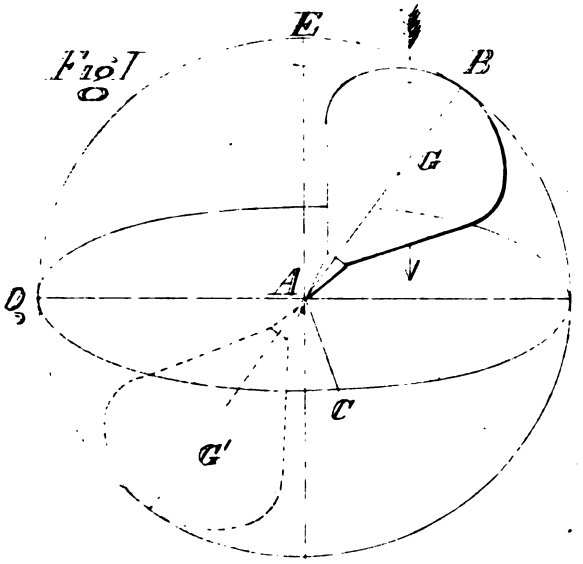
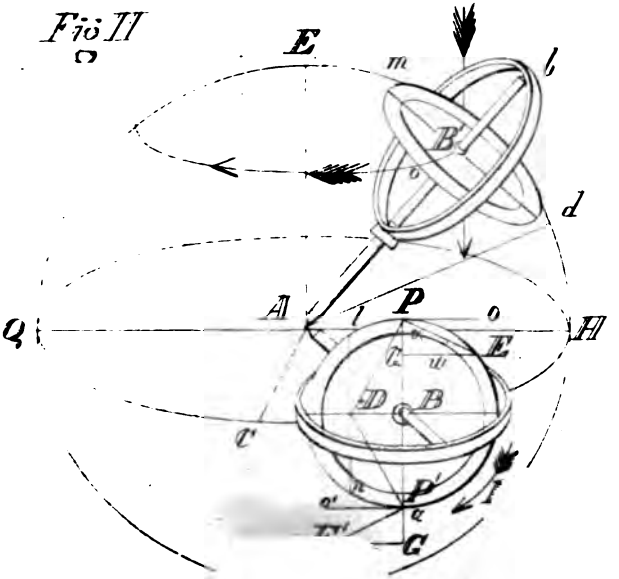


Fig. II



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Advancing towards the subject with this view, and with the tract of the Astronomer Royal on the "Composition of Rotar Motion" as my text book, all mysteries and inconsistencies disappear.

Let a gyroscope be placed with its axis horizontal, and the disc PP' in a vertical position, and let the disc revolve from left to right.

Here I suppose a sphere, HBQ, revolving round its axis, AB, which is horizontal, from left to right in the direction of the arrow K, and a similar figure to the gyroscope, taken from the opposite hemisphere, or what is the same thing, a weight equal to that of the gyroscope, to be applied as a force, acting in a vertical line PB, passing through the centre of gravity of the gyroscope.

This force tends to turn the sphere round the horizontal axis QH.

Then by Prop. 1: "If a body revolve about an axis AB with an angular velocity ω, and if a force be impressed upon it which would make it revolve about the axis AC, with an angular velocity ω', then the body will not revolve about either of the axis AB, AC, but about an axis AD, in the plane BAC; so that

$$\sin BAD : \sin CAD :: \omega' : \omega."\text{—}(Fig.\ 2.)$$

And by Prop. 3: "If a uniform force act upon the body, tending to give it a motion of rotation about an axis which is always perpendicular to the axis about which it is at each instant revolving, and always in the plane BAC, then the angular velocity will be unaltered." In this case the axis QH, about which gravity tends to turn the gyroscope, is always horizontal and perpendicular to the axis of the gyroscope AB.

And by Prop. 4: "Under the same circumstances the axis of rotation has a uniform motion in space from the position AB towards AC, and the angle described in $1'' = \frac{\alpha}{\omega}$."

Where α represents the angular velocity round the axis QH' caused by gravity acting on the weight of the gyroscope, and w the velocity of the sphere or gyroscope on its polar axis AB.

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The axis QH, round which gravity tends to turn the sphere, must always be horizontal, and at the same time always at right angles to the polar axis AB. Consequently, if the velocity round the polar axis w is constant, equal angles to $\frac{\alpha}{\omega}$ will be added to the angle BAD each second.

But suppose that PDP' represents the disc of a gyroscope, (*fig.* 2) with its axis AB, horizontal, and suppose that the disc is revolving in the direction of the arrow K.

Now take any two points in the disc, such as P, and P', and draw PO, and $P'O'$, to represent, in direction and magnitude, the tangential velocity of those points, caused by the rotation of the disc round the axis AB; and also let PG, and $P'G'$, in a similar manner represent the velocity caused by gravity in turning those points round the horizontal axis QH, in a short interval.

Then PE and $P'E'$ will be the resultant of those forces, and the points P and P' will have a tendency to move in those directions at that instant; but as the centre round which the points P and P' have a tendency to move must be in a line perpendicular to those directions, it follows that the intersection of the lines PD and $P'D$ must be the point round which P and P' have a tendency to turn at that moment.

And taking any other point in the disc, and applying the force of gravity and centrifugal force, it will be found that that point also will have a tendancy to turn round the same point D. Now, as the points in the disc are constrained, they cannot revolve round the point D; but as the atoms on one side of the line ln, have too small a centrifugal force for their position, whilst those on the other side of the line, have too great a centrifugal force for their position, it follows that the point B will be urged towards D; Because the triangle PGE is similar to the triangle PBD, we have $\frac{DB}{PB} = \frac{PG}{GE} = \frac{\alpha}{\omega}$. As PG is a function of AB, (the distance of the centre of gravity of the gyroscope, from the support A,) DB, will represent the angular velocity to the radius AB,—the same

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fraction as Professor Airy uses for the angular velocity of the axis AB, towards AC, (Prop. 4.)

Now, when the axis of the gyroscope is not horizontal, but in the position Ab, (*fig.* 2), the force of gravity acts on the point B, in the direction of the arrow; and as the point B is constrained to turn upon the point A, it has at that moment a tendency to move in the direction of the tangent $B'd$; and resolving the force of gravity in the direction Bd, at right angles to the axis Ab, we have the force in the direction $Bd = G \cos \theta$, where G represents the force of gravity, and θ the angle that the axis of the gyroscope makes with the horizon; and as all the points in the line md are constrained at that instant to move in the direction of the tangent, we have, in the first position of the gyroscope, to substitute for gravity (represented by the line $PG = \theta$) $G = \alpha \cos \theta$.

Now, the greater the angle θ, the slower the velocity of the gyrascope round AE. We also see that the greater θ is, the smaller is the circle round which B moves, but the velocity of the point B, and the circle round which B moves, varies as $\cos \theta$, which accounts for the fact, that whatever position the axis of the gyroscope is placed in, the point B always performs a revolution round the vertical axis AE, in the same time. In this experiment care must be taken that the velocity of the disc on the Polar axis is the same in all cases, *i.e.*, that the fraction $\frac{\alpha}{\omega}$ is the same.

Another peculiarity of the gyroscope is, that when the axis AB is placed in any position, such as AB (*fig.* 2), after a short time it is clearly seen that the velocity of the point B, round the vertical axis AE, is greater than at first starting, and also that it continues to increase its velocity.

The explanation of this, from what has been said before, is very simple.

Since we have shown that the angular velocity of the axis AB towards AC is equal to $\frac{\alpha}{\omega}$ where $\frac{\alpha}{N}$ represents the velocity round

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the horizontal axis (*fig.* 2), caused by gravity, which is constant; but $\frac{\omega}{}$ represents the velocity of the disc on its polar axis, which is always decreasing, we see then that the fraction $\frac{\alpha}{\omega}$ is continually increasing, therefore larger angles are added each moment to BAD.

After the gyroscope has been placed in any position, it is soon seen that the axis AB begins to droop, and it continues to fall until finally the circumference of the gyroscope touches the support H, *fig.* 3. It is very evident that gravity has nothing whatever to do with pulling down the axis AB, because we see in the 1st Prop. that when the gyroscope is acted on by gravity and the rotation of the sphere, the new position of the axis must be in the plane BAC; and that as the axis AC is of a necessity always horizontal, and at right angles to the polar axis AB, it follows that the axis AC generates a circle, whilst the polar axis AB generates a cone, except when AB is horizontal.

We see by the foregoing propositions that the force that causes the axis Ab (*fig.* 2) to fall must be a force that tends to turn the sphere round the vertical axis AE.

Take any point d in the vertical plane EAH, and suppose that the sphere HCQ is revolving round the axis Ab, and let Ad be the new position of the axis, then the velocity round the vertical axis AE in the direction QCH must tend to depress the point d below the surface of the paper, as much as the rotation round the axis of the sphere Ab tends to raise it.

From this we see that if a sphere is revolving round its axis Ab in direction $d\,o\,m$, and a force be applied to turn the sphere round its vertical axis AE in the direction QCH, then will the axis of the gyroscope Ab assume some lower position, such as Ad.

Now, it is easy to discover that the force that tends to turn the gyroscope round the vertical axis AE in the direction QCH is resistance of the air. It has been shown that the slower the disc of the gyroscope revolves on its axis, the greater the fraction $\frac{\alpha}{\omega}$ or the angular velocity of the polar axis AB round the vertical AE, and

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Fig. III

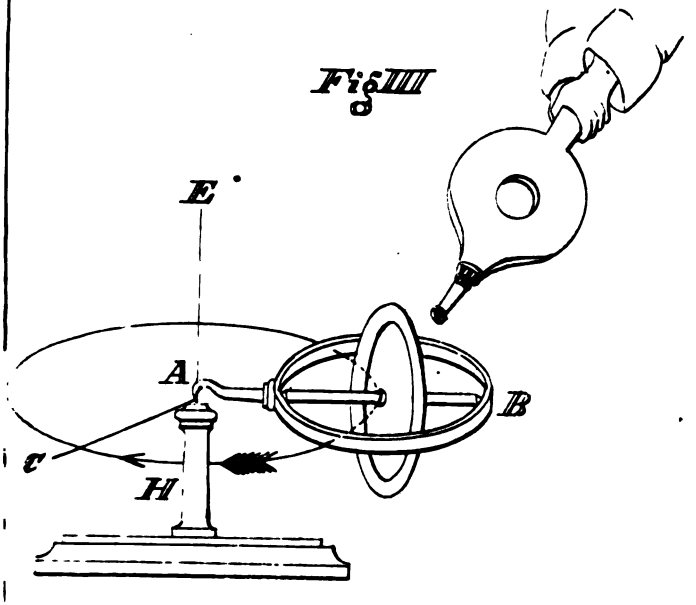
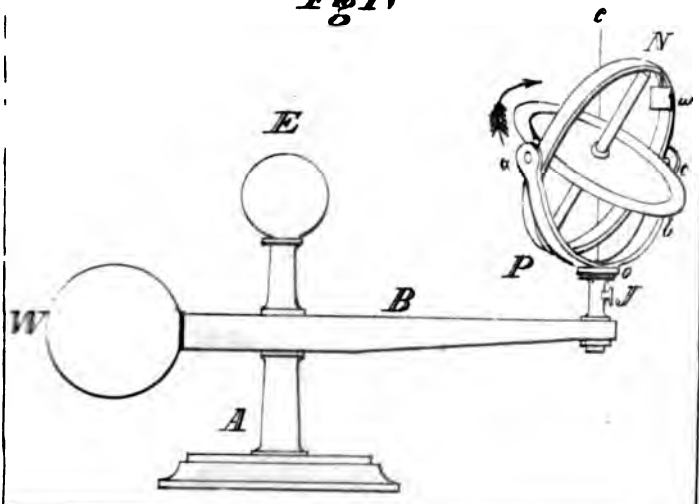


Fig. IV



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consequently the greater is the resistance of the air opposed to the gyroscope, and consequently the axis AB of the gyroscope will droop more rapidly as the fraction $\frac{\alpha}{\omega}$ increases.

But we will prove by experiment that resistance of the air is the force that causes the axis AB to droop.

Place the gyroscope in the position (*fig.* 3,) with the axis AB horizontal, and the axis moving in the direction BHC.

If the resistance of the air causes the axis AB to droop, then if we take a pair of bellows and blow in the direction BH and give the gyroscope a fair wind, then the force of air tends to turn the gyroscope round the vertical axis AE in an opposite direction, and the axis AB, instead of drooping, will immediately begin to rise; which it does, and the harder you blow the quicker the axis will rise. In order that you may not suppose that you are blowing the gyroscope up, hold the bellows a little above the gyroscope, and the effect will be that the part of the force that tends to depress the gyroscope, or to turn the sphere round the horizontal axis AC, will assist gravity and quicken the velocity of AB towards AC.

If you blow from beneath sufficiently strong so that you overcome the force of gravity, then the motion of the gyroscope round the vertical axis AE immediately stops.

In a gyroscope fitted with a counter weight W, and the support made to turn on an axis AE, *fig.* 4. The gyroscope is fitted with the steel shaft o, of the outer frame b, to move freely in the pipe J.

When the disc was revolving in the direction of the arrow, and when I turned the arm of the support B rapidly round the axis AE, the pole N of the gyroscope would droop.

Now, resistance of the air could have nothing to do in turning the sphere NP round the vertical axis $o\,e$, for in this form of gyroscope, the centre of gravity of the disc is supported by the steel shaft O, and therefore some other force must tend to turn the sphere round the vertical axis $o\,e$, as it is only by such a force that the pole is made to fall.

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But in this case, the friction of the pipe against the steel shaft is the force that tends to turn the gyroscope round the vertical axis in an opposite direction to that in which the arm of the support B is moving.

For, as the axis of the gyroscope PN remains in one direction, whilst the arm of the support B is turned round a whole circle, it follows that the pipe J is rubbed against the shaft o, during that time; but to prove that the friction of the pipe is the force that causes the pole N to droop, I moved the arm B rapidly in the opposite direction, changing thereby the direction of friction round the vertical axis $o\,e$, and immediately the pole N began to rise.

Another form of the same experiment is seen by hanging a small weight to the ring that supports the axis of the gyroscope. Now, as this weight exerts a force to turn the sphere (which the gyroscope represents) round the horizontal axis $a\,c$, the precessional motion takes place, getting quicker and quicker as the rotation of the disc on its polar axis PN gets slower, or the fraction $\frac{\alpha}{\omega}$ gets larger.

The pole begins to droop as in the former experiment, in consequence of the friction of the pipe against the shaft o, which may be considered as a force tending to turn the sphere round the vertical axis in an opposite direction to that in which the weight w is moving.

If you stop the precessional motion by turning a screw in the pipe J, the weight w falls very rapidly, in consequence of the greater force being exerted to turn the gyroscope round the vertical axis, which then is exactly equal and opposite to the force that moves the sphere round the axis $o\,e$.

Now, take the case where the gyroscope is attached to a string. (*fig.* 5.)

Of course it is immaterial whether the centre of the sphere, or the end of the axis of the gyroscope, is supported on a point, or sustained by a string; the direction of the force is the same in both cases.

When the sphere or disc revolves on its polar axis in the direction of the arrow, the axis AB begins to revolve round the verti-

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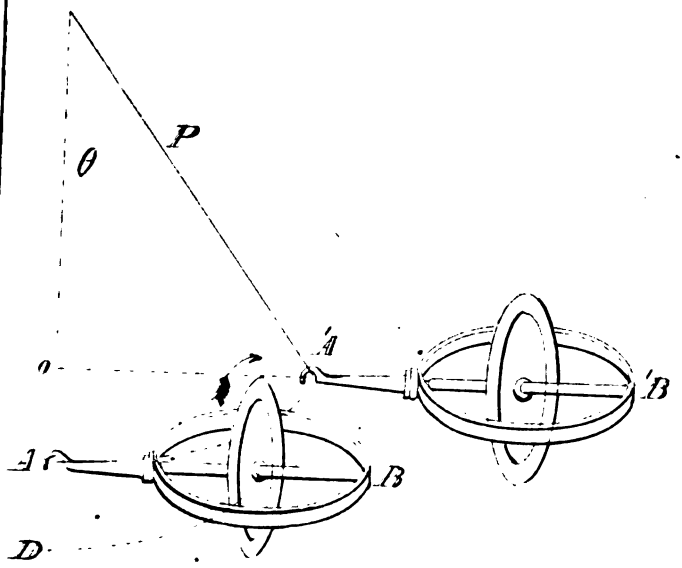
Fig. 1



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cal axis, or string in the direction BD, and the moment it does so there is a centrifugal force $= \frac{V^2}{r}$ where V the velocity in the curve, and r the radius of curvature, and in consequence of this centrifugal force the string leaves the vertical position, making an angle θ.

As the centripetal force must always be equal to the centrifugal force, and always in the same line, the point A leaves its original position, taking up some position such as A', until the strain on the string multiplied by sine θ is equal the centrifugal force, that is, $P \text{ sine } \theta = \frac{V^2}{r}$, where P represents the strain in the string. It is very evident that the force in the direction $A'O$ must be equal to the centrifugal force, and that the gyroscope will fly out until it does.

The radius of curvature is evidently $B'O$, as $B'O$ must be in a straight line, consequently the point A' is carried round in a circle.

It must be remembered that no pulling of the string can in any way affect the inclination of the axis $A'B'$ to the horizon.

In trying this experiment it is difficult to prevent the whole getting a pendulous motion, which gives the gyroscope the appearance of a bird with a piece of string tied to its leg, but on making due allowance for the different motions, this experiment offers no novelty that cannot be fully explained by the tract on "Rotary Motion."

I will now explain why a top goes to sleep, or how it is that the axis of the top assumes a vertical position, and how the centre of gravity of the top is raised through a distance equal to the versine of the angle of inclination.

In this case as in others, I consider the top as part of a sphere, the point of support the centre of that sphere, the top and the sphere both revolving on a common axis.

When a top is spun, the following peculiarities are observed:

If the axis of the top is inclined, the top will describe a curve with the pole of the top, or sphere, leaning in the direction of the normal to the curve. The top assumes a vertical position gradually, and as it does so, the radius of the curve that the top is de

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scribing becomes less and lesser, and finally the top goes to sleep with its axis in a vertical position.

After a time, when the rotation of the top on its axis is greatly diminished, the peg of the top describes small circles, and the axis of the top inclines more and more towards the horizon, whilst the centre of gravity of the top remains nearly stationary, and the top rotates round the vertical line. When the inclination of the axis of the top gets so great that the bilge of the top touches the ground, it then rolls into the gutter.

In offering an explanation of these different motions of the top (*fig.* 6), I may observe that the translation of the centre of the sphere, or the motion of the peg of the top along the curve, does not in the least interfere with the rotation of the top or sphere. *

The top may be considered a gyroscope, with the centre of the sphere in motion, instead of being fixed as in the gyroscope.

The position $A'B'$ of the top corresponds to the position AB of the gyroscope, the same force of gravity tending to turn the top and gyroscope round the horizontal axes $A'C$ AC in the same direction.

It follows, from the 1st Prop., that the axis of top and gyroscope must revolve round the vertical axes AE $A'E'$, in the same direction.

In the gyroscope the centre of the sphere is kept in one position; in the top the centre of the sphere is free, and as the top inclines the circumference of the peg, rolls along the ground and would describe a straight line, only the force of gravity, tending to turn the top round a horizontal axis, compounded with the rotation of the top on its polar axis, produces a rotation of the axis of the sphere or top, round the vertical axis AE, with an angular velocity $= \frac{\alpha}{\omega}$; Nor does it make any difference (*fig.* 6) that in the case of the gyroscope the vertical axis AE is stationary, whilst the vertical axis round which the top moves is in motion.

* Motions of Points, &c., &c., 265. William Whewell, M.A.

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Fig VI

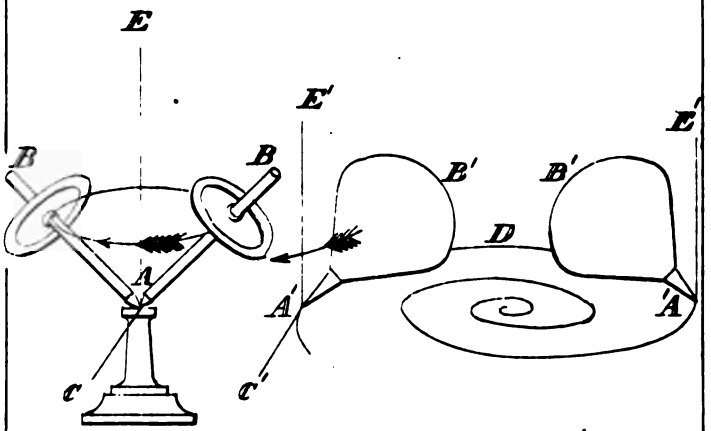
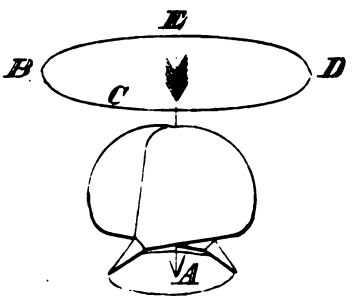


Fig VII



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The horizontal axis round which gravity tends to turn the top $A'C$ is always a tangent to the curve that the top is at that moment describing.

The slower the top revolves on its axis, the greater the fraction $\frac{\alpha}{\omega}$, and consequently the shorter the radius of curvature gets.

In the gyroscope with the centre of the sphere fixed, as the polar axis revolves round the vertical, in the direction of the arrow, the resistance of the air is opposed to its motion, and, as it has been shewn, tends to make the axis of the gyroscope droop. But in the top, as the centre is free, and moves along the curve in the direction of $A\,D$, the resistance of the air acts in a contrary direction, and tends to turn the sphere or top round the vertical axis in the direction of the arrow, which force has been shewn by experiment and by Prop. 1, will cause the axis to rise.

As the top gains the vertical position, a smaller circumference of the peg is brought in contact with the ground. This added to the greater velocity of the axis $A'B'$ round the vertical, causes the radius of curvature to diminish and ultimately the top to sleep

Should the peg of the top get into a hole before it assumes the vertical position, it will never go to sleep, as the resistence of the air then tends to turn the sphere round the vertical axis in the wrong direction.

After the top has remained asleep for some time, the rotation of the top on its axis becomes perceptibly slower, and consequently has not velocity enough to overcome the inequalities of the ground on which it is spinning. The axis of the top is then thrown out of the perpendicular, when gravity instantly acts as a force to turn the sphere round a horizontal axis. But instead of the top starting off on a similar curve to what it did at first, when the axis of the top was equally inclined (*fig.* 7), it now (in consequence of the fraction $\frac{\alpha}{\omega}$ becoming so large) describes a small circle with the centre of gravity stationary on the line AE.

As the head of the top is now moving in an opposite direction to what the peg is, resistance of the air again acts in the wrong direc-

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tion, and tends to turn the sphere round the vertical axis AE in the direction *BCD*. The fate of the top is now sealed. The slower the rotation of the top on its polar axis becomes, the greater the fraction, $\frac{\alpha}{\omega}$ and the quicker the rotation of the sphere round the vertical axis *AE*; consequently, the polar axis droops more quickly than at first, and ultimately the bilge touches the ground and the top rolls away.

In thus offering a solution to the motions of the gyroscope, top, and tectotum, I have assumed that the peg of the top, and support of the gyroscope, is the centre of a sphere revolving upon a common axis, with a similar figure of revolution taken away from the opposite hemisphere, and by so doing I can, for every motion of these astronomical toys, point out a proposition in the tract of the Astronomer Royal on rotatory motion, which fully accounts for those motions.

Dr. Whewell, in speaking of the top, says: "The axis can never become more nearly vertical than it was at the beginning of the motion, though it will at intervals return to the inclination which it then had. But in the experiment, the top, if inclined at first, will approach to a vertical position, which it will, as near as the senses can judge, attain and preserve for some time, and the centre of gravity will frequently describe a curve approaching to a circle, while the apex or foot of the instrument remains stationary. These differences of theory and practice appear to be attributable to the effects of friction."

Euler thus explains the effect of friction in causing a top to raise itself into a vertical position: "The friction will perpetually retard the motion of the apex *P* of the instrument, and at last reduce it to rest. If this happen before the top fall, it must then be spinning in such a position, that the point can remain stationary. But this cannot be if it be inclined. Hence, it must have a tendency to erect itself into a vertical position."

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Paper VII.—THE CENSUS OF 1861.

By JOHN LANGTON, M.A., President.

(Read before the Society, March 2nd, 1864.)

Upon the appearance of the first volume of the Census of Canada, I undertook an examination of it, with a view of ascertaining whether I could extract from it any useful results with respect to the vital statistics of this country; and especially with relation to the natural increase of the two sections of the Province. Before commencing the work, I had reason to entertain serious doubts as to the trustworthiness of the figures with which I had to deal, and at each successive step of the investigation, I only became the more convinced, that some of the figures given were manifestly wrong, and that much caution must be exercised in assuming the truth of anything that was to be found there. This was not a very satisfactory basis upon which to found any conclusions, and, in point of fact, I found that a large amount of rather laborious calculations had been entirely thrown away, from the evident worthlessness of the foundation on which they had been based. I persevered, however, because it is only from a minute analysis that any judgment can be formed of the extent to which some portions of the work may be relied upon; and I am induced to offer this paper to the Society, partly with the object of showing what results may be considered as at least approximately correct, and partly to warn others from wasting as much time as I have done on those parts which can do nothing but mislead.

It may be desirable, as a preliminary, to explain the nature of the work performed by the enumerators. In their lists the name

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of each individual in a family is given, with columns to shew whether male or female, married or single, and with a column for the age next birth day. There are also columns to shew the number of births and deaths during the preceding year, and the age at which death occurred; and this is all that relates to vital statistics, or to that portion of the subject which we are examining. Now, it would appear probable *a priori*, that with ordinary care, the facts then and there present, viz.: everything relating to the persons living at the time, would be given correctly enough. I do not think that there is any reason to doubt the numbers living, the proportion of males and females, and of married and single, very nearly representing the true state of the population; and the ages would, probably, be not very far wrong, though there is much more doubt upon this subject. Many persons do not know their ages with accuracy, and many may have purposely misstated them. The tendency to guess at the age, and to call it the nearest round number, is forcibly illustrated in the Census of the State of New York, for 1855, by a diagram which shews the immense preponderance of ages stated as 35, 40, 45, &c., over all other ages. But when past facts are recorded, as the births and deaths which occurred perhaps many months before, we could hardly look for the same accuracy, and one would expect the births and deaths to be considerably understated. An error of this kind is not by any means peculiar to the Census of Canada. By the Census of the State of New York, for 1855, the total deaths recorded are 46,297, which gives a percentage on the population of 1.36, a suspiciously low rate; but in the same year, whilst the Census gave the deaths in the City of New York at 11,022, the city registers recorded 23,042. If we merely correct the manifest error in the city, the general rate would become 1.74, but if we suppose the omissions there to be a test of what they were in other parts of the State, it would be as high as 2.84; the true amount is probably intermediate between the two. A very striking illustration of the omissions which are likely to be made of facts, which occurred some time before the taking of the Census, is furnished by the United States Census of 1860. The deaths are there classified according

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to the months in which they fell, and whilst it is notorious from the U. S. army returns, and from the records of Massachusetts, Rhode Island, and other places where regular registers are kept, that August and September are the most fatal months, and that May gives rise to fewer deaths than any other month except June, in the Census returns, by far the largest number is recorded to have occurred in May. The reason is obvious—the Census is taken on May 31st, and the recent deaths are given probably not very inaccurately, whilst a large number of the earlier ones are forgotten. Upon this subject the superintendent of the Census remarks, in rather more poetical language than one is accustomed to find in a statistical return, that "even as the eye perceives the nearer objects in a landscape more fully and distinctly than the remote, so the recollection of past events has a similar recession, which is subject to laws." He proposes a correction from the army returns, viz.: to assume the first quarter as correct, and to add 6 per cent. for the second quarter, 46 for the third, and 58 for the fourth, which must be acknowledged to be rather a singular *law* of lapse of memory. This correction would bring the United States deaths up from 1.27, as given in the Census, to 1.56; but, without putting too much faith in any law of mnemonic perspective, it would appear more natural to assume the number given in May as correct, and to increase the whole number, in the proportion which the deaths in May by the registers bear to the whole. As thus rectified the deaths would be 1.79 per cent. But it would appear that even this is not enough, for the superintendent refers with approbation to an elaborate calculation by Mr. Meech, the exact nature of which is not stated, by which he estimates the deaths during the last fifty years to have averaged 2.2 on the population. From these facts it is evident, that with every care by the enumerators, no reliance can be placed upon the returns of deaths as given for a whole year, and that if any data upon this important subject are desired, we must establish a general system of local registration.

Very nearly the same difficulties exist with regard to the recording of births, but with this difference, that, whereas the returns of

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deaths cannot be corrected, except within very large limits of error, the real amount of births can be approximately recovered, if the Census as to ages be tolerably accurate. In 1851, a column of births was given, and also a column of numbers living under one year, the former being manifestly incorrect, because the returns, from one end of the country to the other, showed a larger number living, than were said to have been born. The number living under one at the end of the year is evidently that of the survivors of those born during the year, and if the deaths under one had occurred with equal frequency in each month of the ages of the children, we should have to add on the average, one half of the number of deaths to the number living, to make up the births; but as a greater number die in the earlier months we should have to add rather more. Taking the New York Census as a guide, where the numbers dying for the first year are given from three months to three months, we should add nearly two-thirds of the deaths under one year. The births in Canada in 1851 would, upon this principle, be about 80,200 instead of 69,420, as given in the Census.

In 1861, in order to avoid this evident anomaly, I suppose, the column of births, as returned by the enumerators, and which was clearly very imperfect, was omitted altogether; but by some singular confusion of ideas, the number living under one was headed "births." I have examined some of the enumerators schedules, and this appears to have been the course adopted in the Census office, but there is no one now left in the department who was engaged in the work, and I have not been able to ascertain the fact precisely; it is certain, however, that the column headed births is added up in the total population, as if it had been the number living under one. Assuming this to be the case, and proceeding as before, the corrected births in Lower Canada would be 43,264 instead of 40,788, and increasing those in Upper Canada in the same proportion, they would be 56,406 instead of 53,178, showing the percentage on the population respectively of 3.892 and 4.031.

The manifest imperfection of the returns, as they stand, will become evident from the following table, shewing the rates of births

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and deaths to the whole population from the returns of other countries:

	Births.	Deaths.	Annual Increase.
Lower Canada, 1861	3.672	1.174	2.498
do. do. as corrected	3.892	.....	.....
Upper Canada, 1861	3.809	.731	3.178
do. do. as corrected	4.031	.....	.....
New York, 1855	.....	1.36	.....
do. do. approximately corrected	3.078	2.300	.778
United States, 1860	.....	1.27	.....
do. do. corrected	.....	2.20	.....
Great Britain, 1859 to 1861	3.465	2.163	1.302
Russia in Europe, 1859	4.335	3.485	.850
Poland, 1840 to 1857	4.102	3.571	.531
Finland, 1857	3.503	3.251	.252
Sweden, 1851 to 1855	3.107	2.117	.990
Norway, 1851 to 1855	3.235	1.722	1.513
Denmark, 1850 to 1859	3.311	2.196	.928
Bavaria, 1852 to 1857	3.342	2.884	.458
Saxony, 1855 to 1858	3.993	2.965	1.028
Prussia, 1855 to 1858	3.831	2.928	.903
Holland, 1855 and 1856	3.184	2.536	.648
Belgium, 1840 to 1851	.....	.245	.....

The rates per cent. of births in Canada, do not differ so materially from those of other countries, as to lead us to infer that they are seriously misstated; and as I have corrected them by the deaths under one, they are probably not far from the truth, through from the imperfection of the returns of deaths, they will be somewhat understated. But it is impossible to believe the rate of mortality, even if we had not other reasons for doubting it, to be even approximately correct. In connection with this subject, moreover, we encounter another source of error, the extent of which it is very difficult to estimate. We have seen in what particulars the information given to the enumerators was likely to be faulty; there is also some opening for further misstatements, from carelessness on their part in recording in their schedules the returns made to them; but, as far as the vital statistics are concerned, the forms are so simple, that I have no doubt the schedules are substantially correct. These schedules were then submitted to the Census clerks, who distributed the matter into a great variety of columns; a kind of work, which, unless a perfect system of

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checking be established, is always liable to produce errors. I am afraid, however, that there was no uniform system, under the inspection of a responsible head, and it is rumoured, I know not with what truth, that when the details did not correspond with the totals, from which they were distributed, the correspondence was arbitrarily forced, or, as the expression goes, the figures were cooked. If this was so, the operators shewed themselves very indifferent cooks, for numerous discrepancies still remain. I have not examined the details to any great extent, but, for the purposes of my investigation, I classified the counties of Lower Canada according to the French element of the population, and took out the ages and deaths of each class separately. I naturally checked my work, by comparing my totals after the new distribution, with those given in the tables, and I found numerous discrepancies. When I could discover no error in my own figures, I added up the columns as printed, and the result has been most materially to shake my confidence in the accuracy of the Census clerks. There were not above half a dozen errors in the additions of the columns of ages, but in the cross additions of the deaths by counties, out of sixty-five columns, of which the table consists, I found twenty-seven to be wrong. The difference between the total deaths as given, and the real total of all the details, is not very great, being respectively 12,928 and 13,103; but this is only because the individual errors balance each other. In some of the counties the difference is very great; thus in Lévis, the total of deaths is given as 142, but the details at the several ages add up to 205. As far as this particular question of the number of deaths is concerned, these errors are of little importance, because the figures, whichever way you take them, are evidently worthless, but they lead one to look with considerable suspicion upon other parts of the table, the ages for instance, where a similar distribution of the enumerators' returns has been made by the Census clerks.

I have given below a comparative table of several different countries, shewing the proportions per cent. living at different ages:

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PERCENTAGE OF POPULATION AT DIFFERENT AGES.

	Canada, 1852.	L. C., 1861.	U. C., 1861.	N. Y.	Great Britain.	Belgium.	Norway.	Denmark
Under 5	18.23	16.731	17.731	13.69	13.08	11.64	13.526	12.882
5—10	13.77	13.593	12.783	11.37	11.70	10.91	11.402	10.723
10—15	12.18	12.421	12.160	10.81	10.73	9.77	9.997	9.947
15—20	11.87	11.828	11.515	10.36	9.89	8.99	8.554	9.501
20—30	16.97	16.806	17.660	19.87	17.46	16.62	17.423	16.187
30—40	10.86	10.476	11.330	14.06	13.09	13.52	13.557	14.286
40—50	7.34	7.365	7.745	9.08	9.82	11.80	8.758	10.355
50—60	5.43	5.127	4.736	5.47	6.89	7.81	7.805	8.182
60—70	2.41	3.244	2.667	3.11	4.51	5.49	5.690	5.010
Over 70	1.28	1 850	1.339	1.71	2.83	3.45	3.289	2.925
Unknown	.....	.558	.335	.47	.....	.....	.....	.....
Under 20	56.05	54.573	54.189	46.23	45.40	41.31	43.479	43.053
20—50	35.17	34.647	36.735	43.01	40.37	41.94	39.738	40.828
Over 50	9.12	10.221	8.742	10.29	14.23	16.75	16.784	16.117

In spite of the marked difference which there is between Canada and all the other countries, in the distribution of the population as to ages, there is such a close resemblance between the Censuses of 1851 and 1861, as to lead to the inference that we have here a real characteristic of our vital statistics. It can only be very partially owing to immigration, for the State of New York, which is similarly affected in this respect, exhibits a very different law of population. It may be interesting to enquire what effect immigration would have upon the classification by ages. The immigration returns of the United States for the last fifty years, shew that immigrants of all ages arrive in the country, and that there is a great uniformity in the proportions at different ages in successive years. Considerably more than one-half of any importation would have no sensible effect upon such a table, as it would only add to the total numbers, without disturbing the relative proportions; and of the remaining part, the effect would be in round numbers, that 10 per cent. of the immigrants would increase the numbers between 15 and 20; 25 per cent. those from 20 and 30; and 10 per cent. those between 30 and 40. But as the whole annual immigration of late years, even in Upper Canada, has apparently rarely exceeded from 1 to 2 per cent. of the population, the numbers

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between 20 and 30, where the effect is the greatest, would not be very materially altered. When, however, the immigration has continued for many years, what disturbance there was, would hardly be perceptible, as the wave of excess of population, commencing between 20 and 30, would gradually extend into the higher ages, and would be succeeded by a similar wave of the descendants of the first immigrants, which would fill up the lower ages in a similar proportion. Almost the only noticeable consesequence of immigration, as exhibited in this table, especially in Upper Canada, appears to be the small numbers in extreme old age, to which the wave of the great immigrations of 25 or 30 years ago has not yet reached. The great excess of the numbers between 20 and 40 in the State of New York, appears to be owing, not so so much to the influx of permanent settlers, as to the temporary resort of persons in the prime of life to the great commercial centres. This tendency is more clearly visible if we take those counties alone, in which the great cities are situated, which exhibit an excess of 6 per cent. on the whole population between the ages of 20 and 40, over what is found in the country parts.

It is not easy to draw any safe inference from such a table of population, as both a high rate of births, and a high rate of mortality have a similar effect in rapidly reducing the proportionate numbers living at the several ages. Indeed, from the great preponderance in all countries of the deaths in the first few years, the two things almost necessarily go together, and an increased number of births involves an increased rate of general mortality. Such a scale, however, as that exhibited by Canada, is generally characteristic of a population growing rapidly by natural increase. If we look more into detail, many anomalies present themselves, which throw a suspicion upon the accuracy of the enumerators. Thus, it is hardly possible to conceive any law of mortality, which in five years would reduce the 17¾ per cent., said to be living under 5 years in Upper Canada, to the 12¾ per cent. living at the next period. In as far as it may be relied upon, this would point to a very large percentage of births with a fearful mortality in the earlier years. Other minor difficulties present themselves in the progress from year to year, but in its

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general features I am inclined to think, that this constitution of population is a true and remarkable characteristic of Canada.

Irrespective of the proportions between births and deaths, with regard to which the Census affords us such doubtful data, there are some other sources from which we may obtain an approximation to the natural increase of the population—of Lower Canada especially. The population of French origin is absolutely unaffected by immigration, what change there has been being in the opposite direction, but if we compare the Census of 1852 and 1861, the numbers of French origin in Lower Canada have increased at the average annual rate of 2.651 per cent., irrespective of those who have left the country in the meantime, which is double the rate in Great Britain, and 40 per cent. more than in Norway, which shews the highest natural increase of any European country, and seems to keep up its character as an *officina gentium*. We may even push our researches to a much earlier period. A Census of Canada was taken with great care just before the conquest. It is frequently referred to in the official correspondence of the day as in progress, but I am not aware that the exact result has been preserved. We have, however, a despatch of Montcalm, of the date, April, 1759, in which he says, that the great Census is at last complete, that he has not as yet seen it, but that it shews a population of 82,000. A Census was again taken by the British authorities in 1765. It was contained in two large folio volumes, preserved in our own library, the first of which was lost in the fire, but the second, which was saved, fortunately contains a recapitulation, shewing the population of the rural districts, exclusive of Quebec and Montreal, to have been 54,275. There is also a note to the effect that including the towns, and making an allowance for the people absent in the woods, the whole population is estimated to be 80,000. This, taken in connection with Montcalm's despatch, appears to afford us a pretty secure basis. Since that time there has been no immigration, except of a few Acadians, whilst there has been a considerable loss to the United States. But if we take the population of French origin in both sections of the Province, we shall have a pretty fair representation, though

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somewhat understated, of the descendants of the 80,000 Frenchmen who inhabited Canada in 1765. The French Canadians must, therefore, have increased during the 96 years, at least at the rate of 2.53 per annum.

We have also a system of registration in Lower Canada, much more perfect than anything in Upper Canada, although there is still great room for improvement. The Prothonotaries' returns for 1861 are much more complete than those for 1860, the year for which the births and deaths are given in the Census. Taking then the returns of 1861, and leaving out of account many of the counties from which no returns have been received, and others which are on the face of them imperfect, leaving out of account, also, Montreal and Quebec, I find forty-one counties with an aggregate population of 626,830, the returns from which appear to be tolerably perfect, and they shew 26,954 baptisms and 9,939 burials, which represent

Births - - - - -	4.300	per cent.	on the	population.
Deaths - - - -	1.586	"	"	"
Natural Increase - -	2.714	"	"	"

These numbers, I have no doubt are rather understated for the counties, in consequence of the imperfection of some of the returns, but the greater mortality of the cities will reduce the rate for the whole Province. To approximate to this we may estimate the remaining counties from the forty-one from which we have returns and then add the cities. Upon this principle I have included the towns of Three Rivers and Sherbrooke, amongst the counties, and I have taken the county of Quebec with the city, as they cannot be clearly distinguished in the returns. The result shews, for all Lower Canada,

Births, ...	4.034	per cent.
Deaths, ...	1.755	"
Natural Increase, . .	2.279	"

With a view of still further testing the subject, I analysed, with great care, the Prothonotaries' returns from 1851 to 1857, inclusive, since which latter date they have not been published. The

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returns for 1858 are also missing. With the exception of Rimouski, Kamouraska, Ottawa and Pontiac, the returns of the Roman Catholic Clergy seem very perfect, but those of the Protestant denominations, except in the cities, are often wanting, and when they do appear, they are obviously imperfect. I therefore only took the Catholic baptisms and burials, and the Catholic population, leaving out those counties or parishes, from which no returns were given, and rectifying the population to the date of each return by the average annual rate of increase from 1852 to 1861. This calculation, which does not seem liable to any serious objection, gives the following result for the Roman Catholic population of Lower Canada:

COUNTIES FROM WHICH RETURNS WERE RECEIVED.

	Births.	Deaths.	Nat. Increase.
1851	4.688	1.728	2.960
1852	4.827	1.778	3.049
1854	4.411	2.007	2.404
1855	4.269	2.037	2.232
1856	4.496	1.758	2.738
1857	4.256	1.698	2.558
Average	4.491	1.836	2.655

QUEBEC AND MONTREAL, INCLUDING COUNTIES.

	Births.	Deaths.	Nat. Increase.
1851	5.023	3.566	1.457
1852	5.168	3.219	1.951
1854	5.435	5.442	.....
1855	5.080	3.234	1.846
1856	4.920	3.054	1.866
1857	5.066	3.086	1.980
Average	5.115	3.600	1.515

ALL LOWER CANADA—assuming the Counties and Parishes from which there are no returns to have the same average rates as other Counties.

	Births.	Deaths.	Nat. Increase.
1851	4.736	2.004	2.732
1852	4.877	1.988	2.889
1854	4.560	2.507	2.053
1855	4.395	2.223	2.172
1856	4.562	1.959	2.603
1857	4.382	1.713	2.469
Average	4.585	2.099	2.486

It will be observed that the rate of natural increase, as deduced from 1861, is quite within the limits of the variations in this

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respect in different years. But making every allowance for the imperfection of the returns of 1861 the smaller rate for both births and deaths in that year is very remarkable. As I before observed, the deaths naturally rise and fall with the births, from the great mortality in infancy, but this nearly constant decrease of births since 1851, seems to point to a large emigration of persons in the prime of life. Nevertheless the rate of increase is very high as compared with other nations, and it is confirmed by the growth of the French population from 1852 to 1861, and during the much longer period since the conquest.

Rate of increase of French from 1765 to 1861	2.53	per ann.
Rate of increase of French from 1852 to 1861	2.651	per ann.
Rate of increase of Catholics in Counties (mostly French) from 1851 to 1857.....	2.655	per ann.
Rate of increase of Catholics in all Lower Canada from 1851 to 1857	2.486	per ann.

The near correspondence of the numbers arrived at by such very different methods, inspires great confidence in their general accuracy, and appears to place Lower Canada amongst the most rapidly increasing nations in the world.

In Upper Canada it is not possible to form any similar conclusion. The clergy are required there also to make returns to the Clerks of the Peace, but very few of them reach the Government. The only county, from which I can find anything approaching to systematic returns, is Haldimand, and they are not perfect enough to serve as the basis for any conclusion, even if a single county were sufficient to yield a trustworthy average. But if we cannot arrive at any such satisfactory result, as in Lower Canada, we may make some comparisons as between the two sections, as far as regards the number of births, which forms one important element of their relative rates of increase. The births, as corrected from the number living under one, according to the Census, do not differ very materially from those shewn in the Prothonotaries returns. In the 41 counties of Lower Canada, in which we can institute a comparison, the number living under one, called births in the Census, is 23,353, and if we add to it a proportion of the deaths, as before explained, the number becomes 24,653; but as the Prothonotaries' returns relate to a year later than that for

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which the Census was taken, the whole population, and consequently the births, would have to be increased at the average rate of about 2½ per cent. The numbers, as corrected to the same period, would therefore be 25,279 against 26,954. The main difference is in the deaths, the Prothonotaries' returns giving 9,939 and the Census only 6,498. We may, therefore, for the purpose of comparison between the two sections, take as approximately correct, the births as above deduced from the Census, viz.: Upper Canada, 4.031; Lower Canada, 3,892. This greater proportion of births to the whole population is what one would *a priori* expect from the greater number of the people in Upper Canada at the reproductive ages; but if we take the percentage on the number of married women under forty, which appears to be the truest criterion of the prolificacy of the two sections, the proportions are reversed. With a view of testing the generally received opinion of the greater prolificacy of the French race, I classified the counties in Lower Canada according to their French element, omitting the cities altogether, and I found that in those counties, containing 80 per cent. and upwards of French, the percentage of births to married women was 45.629, whilst in the rest of Lower Canada it was only 40.352, and for all the counties in Upper Canada, also omitting the cities, it was 42.772. The difference is so great and so uniform, even if smaller divisions are taken, that I am inclined to believe that it is truly characteristic, if not of the races, at least of the habits of society amongst them. How far the greater fecundity of the French may be modified by a different rate of mortality, we have no means of judging at present.

If we endeavour to discover the effect of immigration upon Lower Canada, it is observable that the general increase during the nine years since the former Census was taken has been at the average rate of 2.498 per annum, which is almost exactly the same as 2.486, the percentage of natural increase on the average of the several years from 1851 to 1857. The inference seems to be, that there has been no sensible difference between the numbers who have left Canada and the new importations. If we consider separately the population as classed under its origins, taking the figures as we find them, it

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would not appear that there has been any considerable emigration of the French population, for its rate of increase has been almost as great as the natural increase of the counties, and there is rather a larger proportion of French than in 1852, about 76 per cent. against 75 per cent. It is difficult to reconcile this conclusion with the general belief in a large emigration of French. Our loss in this respect may have been over-rated, or the difference may be owing to the imperfection of the Census of 1852; or if it can be attributed to neither of these sources, it would follow that the natural increase must have been even higher than I have estimated it. The numbers of foreign birth are almost the same at both periods, 96,668 in 1861, against 95,153 in 1852, showing that the importations have more than counterbalanced the deaths during the interval. The principal change is in the natives of other origin than the French, whose average annual increase, 2.019, has been much less than the annual natural increase, indicating some considerable emigration of this class, or a much lower natural increase than of the French population.

In Upper Canada, from our ignorance of the rate of mortality, it is not very easy to estimate the effect of immigration, but some important indications may be obtained from a comparison with former Censuses. The first enumeration of the people in Upper Canada with which I am acquainted, was in 1811, when the numbers are stated as 77,000. Up to 1824, when the population was 151,097, the annual increase was at the rate of 5.32 per cent. From that date until the Union we had a tolerably correct enumeration almost annually, and we may exhibit the successive additions at nearly equal intervals.

Date.	Population.	Rate of Annual Increase
1824	151,097	
1832	261,060	8.77
1842	486,055	6.41
1852	952,004	5.62
1861	1,396,091	4.35

The last rate, which is the average for nine years, is less than the lowest recorded for any previous year, with the single exception of 1826, when it was 3.59. The greatest increase recorded is that

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from 1832 to 1834, the average for the two years being 10.73. This constant decrease of accessions from without, point to a rapidly approaching period, when we must mainly depend for increase of strength upon the natural growth of the people already settled in the country. A large proportion of the increase is, however, still be attributed to immigration, and it is an interesting enquiry what that proportion may be, and how much is due to natural growth. The data are very imperfect, but we may arrive at a very rough approximation, or at least ascertain the limits within which the additions from immigration and from natural increase must have been.

If we assume the natural increase of Upper Canada to be at the annual rate of 2½ per cent., which is nearly the rate arrived at for the whole of Lower Canada, from the Prothonotaries' returns, there would remain an addition of 207,170 to the population unaccounted for, and which, on this supposition, must have arisen from immigration. The returns of the Emigration Office shew, that from 1852 to 1860, both years inclusive, 225,865 steerage passengers arrived at the ports of Quebec and Montreal, and 123,631 appear to have come through the United States, during the same period. Of these, 181,741 are returned by the local agents as being settled in Upper Canada. Allowing for the natural increase of these at the same rate, for the mean period of 4½ years, the number would be raised to about 200,000. This appears to be the extreme possible limit to which immigration can have swelled the population, and it would require a natural increase of rather more than we have taken for Lower Canada, to account for the remainder.

But the numbers who are supposed to have permanently settled in the country, are probably stated too high, and there has notoriously been an emigration of persons living in Upper Canada before 1852, which must have most materially reduced the balance. The numbers of foreign birth living in Upper Canada in 1852, were 399,494, which, in 1861, had become 493,212, making an increase of 93,718. All of these must have been immigrants, and there must have been as many more as would replace those of the

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399,494 who had died. As a great number of them would be in the prime of life, we can hardly estimate the rate of mortality as high as 1 per cent, but, even on this estimate, the numbers of new emigrants would only be about 128,000, or with their natural increase as above, about 140,000, so that the increase based on the Emigrant Agents returns, would appear to be overestimated. But, on the other hand, the United States Census shews that the natives of British America had increased from 147,700 in 1850 to 249,970 in 1860. The several provinces are not distinguished in the United States returns, but in the State of New York, in 1855 the Canadians were rather more than nine-tenths of those from all British America. Even allowing that in Maine and other Eastern States, a larger proportion may have been from New Brunswick and Nova Scotia, and that there were certainly many Lower Canadians amongst them, it is hardly too much to assume that of the 102,000 added to the population of the United States, one-half were from Upper Canada. This would leave a very small balance in favor of Upper Canada, certainly not as much as 100,000. If we estimate the whole accession due to immigration at that amount, it would require an average rate of natural increase to account for the whole number, of at least 3½, which appears much higher than is probable. The truth probably lies between the two limits as thus arrived at, but it seems certain that the natural growth of the population in Upper Canada must be more rapid than that of Lower Canada.

I have been induced to enter into these details partly with a view of shewing what conclusions we may draw, with some degree of confidence, from the statistical data to which we have access, and partly to point out the extreme insufficiency of these data, and the doubts which must rest upon many points of the utmost importance in relation to the future prospects of our country. My labour will not have been in vain, if any one should be induced by the observations I have made to press upon the Legislature the necessity for organizing some system upon which more trustworthy statistics may be obtained. The main things which appear to be wanted are—a more perfect organization for collecting and tabulating

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the facts, and a greater frequency in the returns by a compulsory local registration. The decennial census would still be necessary, as there are many important facts, which it would be too cumbersome and expensive to attempt to collect at shorter intervals; but there are also many details which could easily be recorded annually, and which could then be obtained with much greater accuracy. Not the least advantage to be derived from a more frequent registration would be, the preparation which it would supply for conducting properly the more perfect decennial Census. The collection, tabulating and discussion of the multifarious details of a great Census, simple as each individual process appears to be, require some special training in those who are engaged upon it, and a well devised system of checks under a responsible head, to prevent the recurrence of such gross errors as are to be found in the two last Censuses. It is hardly possible to expect any much better result to follow from the returns of enumerators, who have had no experience in the work expected from them, and from submitting their schedules to a body of extra clerks, called in for the occasion, who appear to have worked without concert, and almost without supervision.

The system which I would recommend, as most likely to produce a valuable body of statistics, would be the following:—It might still be desirable to require the clergy of the several denominations to make returns of their marriages, baptisms and burials, as at present; but the baptisms and burials after all only approximately represent the births and deaths, and experience has shewn that it is almost impossible to obtain, in this way, punctual and correct returns; and in Upper Canada especially, as in other countries where there are a great variety of religious denominations, it would be hopeless to expect any accuracy from such a source. These returns might act as a check upon the facts as otherwise obtained, but there can be no system of registration approaching to completeness other than a compulsory civil registration, as in England and most European countries, and in some of the states of the neighboring Union. Every person should be bound under a penalty to register with some local officer, within a given time,

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every death or birth occurring in his family, and in order to remunerate the officer, and to give him an interest in the completeness of the registry, a small fee should be payable to him on each entry. I would take advantage as far as possible of our present municipal organization, and, in Upper Canada at least, the local officer might be the township clerk. As the township clerk is often changed, and as there is generally no proper office in which the registers could be safely kept, I would require the township clerk to file the originals with the registrar of the county, at the end of every quarter. These registers, besides their use for statistical purposes, would serve as an authentic record of births and deaths, which, together with the registration of marriages, which is already made in the registrar's books, would be always open for reference in questions of succession to property. Both objects should be kept in view, and the form of the registers might perhaps be something like the following:—The township clerks might be supplied by the registrar with sheets ruled in columns shewing, for births—date of birth, sex, name, father or mother's name, signature of person making the registry, date of registry; and for deaths—date of death, name, age, disease, signature of person making the registry, date of registry. Each sheet, when returned to the registrar, should bear the certificate of the clerk. In Lower Canada, where the municipal organization is not so perfect, it might be desirable to have some other local registrar than the township clerk, and the sheets might be deposited as at present with the Prothonotary; but the forms, and as far as possible the system, should be uniform in the two sections, and the registration should be that of births and deaths, and not merely the ecclesiastical record of baptisms and burials.

It should also be incumbent upon the assessor to have a column in his roll for the numbers in each family. This used always to be done in Upper Canada before the union, and gave very little trouble, and the numbers under fifteen are still given for school purposes. It might be desirable to distinguish males from females, and to have some general classification as to ages, as under 5, 5–15, 15–40, above 40, but it would not be wise to enter into too much

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detail. This portion of his roll should be made out separately, and should be handed over by the clerk to the county registrar.

I would throw upon the registrar the duty of compiling from these materials the returns to be made annually to government, on forms to be furnished to him, which should not enter into too much detail, and I would pay him out of provincial funds for the work. The remuneration need not be very high, and the total cost would be quite an insignificant item; but I hold it as a most essential part of any such scheme, that everybody should be paid for the work imposed upon them. It is the only way in which correct and punctual returns can be expected. However conscientiously even the best men may perform any act required of them as a duty, they will do it more readily and more certainly, if besides discharging the duty, they make $20 or $30 by the transaction.

With such an organization, we should have a certain set of men all through the country, the assessors, the township clerks, and the registrars, who had already some experience in the kind of work, and they would form a useful material, out of whom to select the enumerators and commissioners, when the more formal Census came to be taken. There would remain the organization of the department of government, on which would fall the duty of classifying and tabulating the returns received from the whole country. The returns of vital statistics would form only one portion of this work. The statistics of trade and navigation, of railways, of banks, savings banks, building societies, insurance companies, hospitals and charities, and schools, criminal and other judicial statistics, militia and municipal statistics, should all be ultimately combined into one annual volume. The preparation of these, and still more, the devising of the best forms in which the information should be collected, and presented to the public, would require much miscellaneous knowledge and experience, which could hardly be expected to be found in any one department. There should be a board of statistics, presided over by one of the Executive, and and of which some others of the ministy, the minister of finance especially, might be members. But the real work would fall upon the deputy heads of those branches, which are especially concerned

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with the subjects embraced in the general plan, and who should also be members of the board. The business of the board, as such, would be almost exclusively deliberative—to decide upon what information should be collected, and to devise the best forms in which it should be submitted, so that the statistics of one branch might harmonize with, and throw light upon, those of another. I may give an example of what I mean: The trade and navigation returns shew the amount of timber and lumber exported, and the report of the Commissioner of Crown Lands gives the statistics of the several timber agencies; but from want of concert between the two departments, the forms in which the returns are exhibited make it impossible to connect the two sources of information upon this most vital portion of our industry, so as to trace the article from the various sources from which it was produced, to the quarters in which it found a market. The board would only lay down a general plan; the individual members would each be responsible, as part of the business of his own department, and with his own staff, to collect the information required. The only other thing required, besides the occasional assistance of copyists, would be a thoroughly competent secretary, with perhaps, one clerk, who would collect some of the returns, and superintend and publish the whole.

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PAPER VIII.—GLANCE AT THE PRESENT STATE OF THE COMMON GAOLS OF CANADA.—INDIVIDUAL SEPARATION OF PRISONERS (WITH SHORTENED SENTENCES) RECOMMENDED ON MORAL AND ECONOMIC GROUNDS.

BY E. A. MEREDITH. LL. D.

(Read before the Society, April 6th, 1864.)

"There are in every county in England large public schools, maintained at the expense of the county, for the encouragement of profligacy and vice, and for providing a proper succession of housebreakers, profligates, and thieves. They are schools, too, conducted without the smallest degree of partiality or favour, there being no man (however mean his birth or obscure his situation) who may not easily procure admission to them. The moment any young person evinces the slightest propensity for these pursuits, he is provided with food, clothing and lodging, and put to his studies under the most accomplished thieves and cut throats the country can supply. There is not, to be sure, a formal arrangement of lectures, after the manner of our Universities; but the petty larcenous stripling, being left destitute of every species of employment, and locked up with accomplished villains, as idle as himself, listens to their pleasant narrative of successful crimes, and pants for the hour of freedom, that he may begin the same bold and interesting career."

THIS is the picture drawn by the late Sydney Smith of the prisons of England, a little more than forty years ago—a perfectly true picture, he tells us, of the prisons of many counties in England at that time. Happily, a great revolution has since then been effected in prison discipline in England, and if there is still much room for improvement in her prison system, yet there are few, if any, prisons in that country to which the preceding description would now be applicable. To bring about that much-needed reform, few, perhaps, contributed more than the famous Canon of St. Paul's, whose strong good sense, caustic humour, and trenchant logic were never employed with more effect or more hearty good will than in laying bare the social abuses of his time. And if the prison discipline of England is to attain a still higher degree of excellence, it will probably be by following out and developing the admirable practical suggestions contained in the essays on prisons written by Sydney Smith more than forty years ago.

It is a very strong argument to my mind, in favor of the views

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which are advanced in the present paper, that they are in the main identical with those so powerfully enforced by that great social reformer.

The picture given by Sydney Smith, though intended for the gaols of England alone, was unhappily applicable to the gaols of nearly all countries at that time. Certainly it contains a most truthful representation of the condition of the gaols of this Canada of ours a few years back. The first important step taken in Canada, towards reforming our prison system, was by the establishment, in 1859, of a Board of Inspectors of Asylums and Prisons. As a member of that Board since its first establishment, I certainly am not inclined to undervalue its labours in the matter of prison reform, and during the course of the remarks which follow I shall have occasion to notice some of the improvements which have been effected in our prison system through the instrumentality of the Board. But the powers of the inspectors reach but a short way, while the evils to be remedied were of long growth, widely spread, and deeply rooted. Though much, therefore, has already been done, much, very much, remains to be done before we can rest satisfied with our work, before we can pretend that our prisons and prison discipline in Canada are at all what they ought to be in a civilized and Christian land.

We have said that Sydney Smith's picture of the county gaols of England forty years ago was a faithful representation of all our gaols in Canada, a very few years back. Is it possible that it is a faithful picture of any of our prisons at the present day? Can it be true that any of our gaols now are nurseries of crime, schools where our criminals are trained in vice and educated for the penitentiary and the gallows? Can it be possible that we still have gaols where we are systematically *manufacturing* criminals instead of *reforming* them? Those who are best acquainted with our common gaols, particularly those of our larger cities, Quebec, Montreal and Toronto, will be least likely to answer these questions in the negative.

> "Pudet hæc opprobria nobis
> Et dici potuisse et non potuisse repelli."

If, then, it must be admitted, as with shame it must, that there are many gaols in the country which are obnoxious to the charge of being schools of vice and crime, it becomes us to consider whe-

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ther this frightful state of things shall be permitted any longer to continue. Is it hopeless to attempt to remedy the evil? The cause of the evil is patent to all, nor is the true remedy far to seek. The source of the evil is the present unchecked association of prisoners which obtains in many of our gaols, especially in our large city prisons, and the obvious and only remedy of the evil is to be found in putting an effectual stop to this practice, and enforcing a strict and absolute separation of the prisoners from each other during the whole period of their imprisonment.

The object, then, of the present paper is to advocate this system of separation among prisoners in gaol, and I trust that I shall be able to show that by establishing this system we may not only reasonably hope to prevent our gaols from being, as they have hitherto been, centres for the dissemination of vice and crime through the country, but that we shall also render them much more deterrent in their character and at the same time materially diminish their cost to the country.

The repression of crime is, it is almost needless to state, the paramount object of all penal legislation and of all penal institutions. It is for this purpose that the State has organized its costly machinery of refuges, reformatories, gaols and penitentiaries. But while the great aim and object of all these institutions is one and the same, the agencies by which they severally seek to effect it are widely different. These agencies may be said to be three-fold—preventive, remedial, and deterrent. All the institutions we have named employ to some extent each of these agencies, but they employ them in very different degrees. Refuges or homes for example are essentially preventive; reformatories are mainly remedial; while penitentiaries and gaols partake more of the deterrent character than of either the preventive or remedial.

The remarks which follow are meant to apply more particularly to common gaols as distinguished from *Central* or *District* gaols, such as exist in other countries, and such as the Board has earnestly laboured to have established in Canada. In other words, they are more particularly applicable to gaols for *short-sentenced* prisoners.

Common gaols, such as are now referred to, are supposed to assist in repressing crime in two ways:

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Firstly and immediately—by protecting society from the depredations of the criminals shut up within their walls; and,

Secondly and principally, though indirectly—by the moral influence they exert in deterring evil-disposed persons from the commission of crime.

So far as the first point is concerned, all gaols and all other places of confinement for prisoners are equally useful. It is not a question of discipline but of construction—a question simply of walls, locks and bolts. On the other hand, the usefulness of a gaol under the second aspect, that of deterring from crime, will depend almost altogether on the discipline enforced in it.

To deter from crime may, therefore, be said to be the proper function of a gaol. I should be happy were it in my power to state that I regard the common gaols of Canada as aiding in the repression of crime, by the reformatory influences which they exert on the minds of the prisoners passing through them. Few common gaols indeed in any country have any true claim to be classed as reformatory institutions, and, unfortunately, the gaols in Canada form no exception to the general rule.* Indeed, the shortness of the sentences, and the absence of any attempt to impart either secular or religious instruction to the prisoners during their imprisonment, would preclude the hope that any important moral improvement could be effected in the prisoners while confined in our common gaols. The reformation of our criminals, if it is to be effected at all, must be effected by means of our reformatories and penitentiaries, or by our central prisons, should they hereafter be established.

It being admitted, then, that the especial function of our common gaols is to deter from crime, our primary aim should be so to order their discipline as to inspire evil-doers with a wholesome dread of them; that when they leave them they may do so with a firm resolution to avoid them for the future.

*Among the list of questions put to every convict about to be liberated from the penitentiary, is one as to whether the imprisonment in the common gaol, which he underwent before coming to the penitentiary, had exerted a beneficial effect on him or not. There is not probably one convict out of every hundred who answers that he was benefitted by his imprisonment in gaol. The answer almost invariably given is that the convict left the gaol decidedly worse than when he entered it!

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The question then, How shall our gaols be rendered most effectual in repressing crime? may be presented in another shape. How shall we organize our gaols so as to increase (without resorting to cruel means) their deterrent influence? The deterrent influences commonly brought to bear in other countries upon prisoners in gaol (over and above the simple loss of liberty), are generally hard fare, hard labor, and solitary confinement or entire separation from their fellow prisoners during the period of their imprisonment.

When the Board of Inspectors of Asylums and Prisons was called into existence, a little more than four years ago, the common gaols throughout the province can hardly be said to have exercised any deterring influence whatever upon the criminal classes. Imprisonment in gaols then did not involve hard fare, hard labour, nor indeed any separation of the prisoners beyond the separation (in many gaols very imperfect) of the sexes. Instead of this the prisoners received, in the great majority of prisons, much better fare than they could have obtained outside the prison walls; of labour there was absolutely none or next to none, and classification or separation was not dreamt of, and was indeed in most prisons (from defective construction or inadequate accommodation) impossible. Everywhere the tried and the untried, the young and the old, the novice in crime and the practised and hardened offender, the modest and perhaps innocent girl and the most lost and degraded of the sex, were thrown together in one common apartment, where they had nothing to do the livelong day but recount old deeds of villainy and concoct schemes for the commission of new. In some of the gaols, indeed, they were allowed to relieve the monotony of their prison life with games of checkers, and with reading newspapers and novels. To the habitual frequenters of our gaols it is almost needless to say that this mode of life must have been most attractive, and to few or none would it have presented any very formidable aspect.

The Board have striven earnestly to remedy, as far as in their power, these very grave defects in the old *régime* of our prisons. They have laboured, and with very considerable success, to have all the old gaols so altered and improved as to conform to the salu-

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tary requirements of the law, so far as regards the classification of the prisoners, and their strict separation from each other at night. Again, they have in their rules established for all the prisons, a uniform "prison dietary," a dietary which, while amply sufficient to support the prisoners in health during the period of their imprisonment, is not more than sufficient for that purpose, and is far below, both in cost and quality, the prison food formerly supplied. They have thus, so far as sanitary conditions would allow, established "hard fare" as part of the ordinary prison system of Canada. They have established a prison uniform, a dress of shame and degradation, for prisoners under sentence. In this and in other ways they have sought to make gaols more like what they should be, places of real punishment, from which men recoil with horror, painful to the memory and terrible to the imagination.

They have, moreover, taken the initiative in introducing the system of individual separation of prisoners, advocated in this paper, by directing that certain classes of prisoners shall be isolated from the others during the whole period of their imprisonment, and this for the avowed purpose of preventing contamination.

Still further to improve the prison system of Canada, the Board have strongly recommended the establishment of central or district prisons, two in Lower and three in Upper Canada, for "habitual offenders," and for all whose sentence is more than say forty or sixty days and less than two years. They have further advocated the appointment of unpaid local Boards of superintendents for all the gaols, with a view to insure their more frequent inspection. To effect these changes, or that recommended in the present paper, the aid of the legislature must be invoked.*

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*There is, indeed, a provision in the statute book, of which I was not aware when I commenced this paper, authorizing the infliction of solitary confinement. It is found in cap. 93, sec. 110, of the Consolidated Statutes of Canada.

"When a person has been convicted of an offence for which imprisonment other than in the penitentiary may be awarded, the Court may sentence the offender to be imprisoned and kept to hard labor in the common gaol or house of correction, and may also direct that the offender may be kept in solitary confinement for a portion or for portions of the term of such imprisonment not exceeding one month at any one time, and not exceeding three months in any one year."

I am not aware that this power of sentencing offenders to solitary confinement is ever exercised in either section of the Province. Indeed, until within

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But while, through the efforts of the Board, many important changes have thus been effected in our system of prison discipline, and while many others have been suggested, it appears to me that the giant evil of the whole system has been left almost wholly untouched and unchallenged. I refer to the free intercourse which the prisoners are permitted to have in their wards or day-rooms. Unchecked association among our prisoners—and there is no check of any kind on the intercourse of the prisoners in our gaols—is synonimous with the corruption and contamination of all who have not reached the level of degradation of the worst and lowest. Classify the prisoners, and you diminish the evil, but assuredly you do not cure it. There is but the one real remedy, and that is the strict and absolute separation of the prisoners one from the other. It would but little avail in our hospitals to enforce cleanliness in the wards, and to secure able medical advice for the patients, if, at the same time, we permitted those who were infected with loathsome and contagious diseases to mix with the ordinary patients. How much more unwise—how much more cruel is it so to organize our gaols (our moral hospitals) as to allow those who are morally diseased to the very core to pollute and contaminate, by their presence and conversation, the young and comparatively (nay, possibly wholly) innocent prisoners whom accident or misfortune may have made, for the time, their associates in person!

If, then, association of prisoners in gaol is in fact (as I hold it is) synonimous with their contamination and corruption, we are bound to put a stop to it. If the State cannot or will not make any effort to reform its prisoners, it is at least its plain and bounden duty to see that those whom it thrusts into prison do not leave it more depraved and vicious than they were when they entered it. If it will not reform them, at least it should not make them worse.

Hard labor constitutes at present the only punishment superadded by the courts in Canada to the deprivation of the prisoner's liberty. But strange as it may seem, this "hard labour" to which

the last two or three years, it would have been wrong to attempt to enforce such a sentence, there being in few, if any, of the gaols, cells suitable for the purpose.

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our prisoners are day after day solemnly sentenced by the courts, really means nothing. The sentence is rarely, if ever, enforced, and in most cases the prisoner hears the last of his hard labour when he has heard the words from the lips of the judge.

The term "hard labour," though so frequently used in our courts, is not, so far as I am aware, defined any where in our Statutes. In England "hard labour" in gaols is generally understood, for even there the words lack legal precision, to mean penal or unproductive labour, such as the tread-wheel, the crank, or shot-drill. Such labour is designated "hard labour," in contradistinction to ordinary industrial labour. There is not a solitary gaol in Canada in which "hard labour," in the sense of penal, unproductive labour, has been or is carried out,—cranks, tread-wheels, and shot drill being absolutely unknown in our Canadian prisons.

But taking the sentence of hard labour in the sense in which it is perhaps generally understood in Canada, as referring that is, to such ordinary industrial labour as is occasionally carried on in our Canadian gaols, as, for example, breaking stones, sawing wood or the like, it is still certain that in this acceptation of the term "hard labour," there are very few prisons in the province where the sentence could be strictly carried out, for the simple reason that there are very few prisons where it is possible to give the prisoners so sentenced constant work of any sort to do.

To introduce "hard labour," in the strict penal sense of the word, into our gaols would of course be possible, by making it compulsory to have in each gaol a tread-wheel, crank or apparatus for shot-drill; but this would involve a large outlay in the first instance, as well as a permanent addition to the staff of each gaol, for the purpose of superintending the prisoners undergoing the sentence. The cost therefore would of itself be a serious if not a fatal objection to such an attempt.

On the other hand, the proved impossibility of obtaining a constant supply of industrial occupation for the prisoners in the common gaols forbids us to hope that by resorting to the use of industrial occupation, the sentence of "hard labor" could be rigidly enforced.

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For myself I do not hesitate to avow, that while I am totally opposed to the false and mistaken humanity which seeks to make the condition of the criminal in gaol an object of envy to the honest laborer outside; while I am prepared to advocate a stern and severe prison discipline, a discipline calculated to teach the lesson "that the way of transgressors is hard"—while I am desirous to see "*penal labor*" part of the ordinary sentence of every prisoner in the *central* gaols, where the proper machinery for the purpose might be established, and the necessary supervision exercised—yet I am fully persuaded that it is wrong in principle and unwise in practice to make any *industrial occupation* part of a prisoner's punishment. Our efforts should be directed rather to conquer than to increase that dislike to labor which, in all probability, has mainly contributed to bring the man to prison. Make ordinary labor part of the prisoner's punishment, and his aversion to labor cannot fail to be intensified. If, on the contrary, the discipline of our prisons could be so organized (as I believe it might be in the proposed central prisons), that the prisoners should come to regard the permission to work as an indulgence and a boon, something would be done to diminish the man's distaste for labor, if not to give him a positive liking for it. "Make your prisoners industrious," said Howard the philanthropist, "and you make them virtuous." Which system is the more likely to make men industrious, that which makes labor a punishment, or that which makes labor a reward?

I do not, however, deem it necessary here to do more than allude to this objection to making industrial labor the sole or principal part of the punishment of the prisoners in our gaols, because, as I have already stated, however anxious we might be to do so, it would be practically impossible to carry out such a sentence.

As a matter of fact, then, we cannot enforce "hard labor," whether "*penal*" or "*industrial*" in our common gaols. But is there anything to prevent us from enforcing what I propose to substitute in its stead—"solitary confinement?" None whatever. All experience proves that the deterrent influence of "solitary punishment" is incomparably greater than that of hard labour, however severe the latter may be. There is no part of prison discipline

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which the ordinary inmates of our gaols dread so much as "solitary confinement," none which exercises so beneficial and powerful a moral influence on the prisoner's mind, especially if accompanied for, at least, part of the sentence with enforced idleness, for "idleness in solitude leads to repentance, idleness in company leads to vice." Solitary confinement is now regarded in truth as the basis of every sound system of prison discipline. Whatever diversity of opinion there may still be as to the propriety of rigidly enforcing "solitary confinement" for *long periods in penitentiaries*, all writers are agreed that for the short-sentenced prisoners of our common gaols "solitary confinement" during the whole term of the sentence is not only unobjectionable and practicable, but that it is the wisest and the best system.

"Solitary confinement" is, however, unquestionably a much more severe punishment than "hard labor," and therefore in England even, where "hard labor" is really enforced in the strictest way by means of "tread-wheels," "cranks," or "shot-drill," ten day's "solitary confinement" is considered as fully equivalent to thirty days' imprisonment with "hard labor." In this country, therefore, where the "hard labor" is entirely imaginary, if "solitary confinement" were substituted for it, the sentences should at the same time be considerably reduced, probably to one-third of their present length.

Let us recapitulate briefly, the advantages which would be gained by thus substituting "solitary confinement" for "hard labor," supposing the sentence of imprisonment to be at the same time reduced to one-third its present length.

First. The punishment would be more formidable to the prisoners, and its deterrent influence consequently much greater. Something would thus be done to render our gaols what hitherto they have not been, "*a terror to evil-doers.*"

Secondly. The moral influence on the minds of the prisoners could hardly fail to be salutary.

Thirdly. Above and before all, it would effectually check the system of corruption and demoralization which must go on in any gaols where prisoners, however well classified, are permitted to associate freely with one another. Our gaols would thus cease to be, as they

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have been hitherto, hotbeds of infamy, and nurseries of vice and crime.*

To this result of the introduction of the system of separate confinement in our common gaols, namely, the checking of the demoralization and corruption of which they have hitherto been the centres, I attach, as I have already intimated, even more importance than to its deterrent influences.

Fourthly. It would diminish immediately (by probably one-half) the average number of prisoners confined in our gaols, and consequently virtually more than double the accommodation of the gaols.

Fifthly. It would diminish the cost of the maintenance of our prisons to the same extent, or nearly to the same extent, as it reduced the average number of prisoners confined in them.

Sixthly. It would tend to bring about what is most desirable, a uniformity of punishment in prisons.

It is hardly necessary to observe that so long as prisoners are sentenced to hard labor, in the absence of any proper machinery in the majority of gaols systematically to enforce the sentence, there must be great inequalities in the penal discipline of different gaols. The severity of the prisoners' punishment will, in fact, be determined, not by the sentence of the judge, but by the extent to which, in any particular gaol, the authorities have the means or inclination to enforce hard labor.

It would have, moreover, this incidental advantage which is worth

*How much it concerns us to check the process of demoralization and corruption now going on among the prisoners in our gaols, will at once be admitted when it is remembered that the average number of annual imprisonments in the common gaols of Canada during the last five years, is between 11,000 and 12,000.

If any one needs proof of the frightful effects of the present system in our unimproved gaols, he will find it in the sad examples furnished in the separate report of Mr. Inspector Ferres for the year 1862; examples, be it remembered, all taken from one single prison, that of Montreal. Alluding to the revelations contained in Mr. Ferres' report as to the way in which criminals were manufactured in the Montreal gaol, a leading newspaper of Montreal remarks: "The gaols of our great towns are nurseries of vice. They breed, rear and educate criminals for the work of preying on society. They rob the community of the wealth that might be earned by felons if saved from this baneful education. They entail the heavy cost of catching, trying, and keeping incarcerated, at these prisons, educated felons"

To put an end to a system which bears such fruits, would be, indeed, a consummation devoutly to be wished; and this we might hope to do by the introduction of solitary confinement.

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noting, that it would relieve the judges from the necessity of daily going through the solemn farce of pronouncing sentences, which they, the prisoners and the public, well know, cannot possibly be enforced.

The ablest writers on the subject of prison discipline in England have, of late years, earnestly urged the necessity of enforcing separate confinement in all common gaols, and recently these views have been advocated most forcibly in the admirable report of the select committee of the House of Lords, on the state of prison discipline in England, made last year. Urging the necessity of the complete separation of prisoners while in gaol, they observe: "The committee entertain a very decided opinion on this head, and having reference to the course of legislation now extending over many years, and the agreement in opinion and practice of the highest authorities, they consider that the system generally known as the 'separate system' must now be accepted as the foundation of prison discipline, and that its rigid maintenance is a vital principle in the efficiency of county and borough gaols." They quote also, with approval, the opinion expressed by former Commissioners, that "the separation of one prisoner from another is the only sound basis on which a reformatory discipline can be established with any reasonable hope of success." *

I have already stated that there is at present an almost universal concurrence of opinion among writers upon the peculiar value of "solitary confinement" as a part of prison disclipline. I may again cite here the opinion of probably the greatest German authority on questions of this sort—Professor Mittermaier—quoted in my separate report of 1862: "The old disputed question," says the professor, "whether the system of 'associated imprisonment' or of 'solitary confinement,' is to be preferred, and how the former might be amended, disappears, giving place to a general conviction, the result of recent investigation, that 'solitary confinement' must be recognized as an indispensable part of all prison discipline. The question at present is rather whether 'solitary confinement' should

* The conclusions of the committee are entirely sustained by the concurring testimony of the very numerous and highly competent witnesses examined before them.

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be adopted as general and only system in carrying out the entire execution of sentences of imprisonment, or whether it shall be employed only for a part of the sentence."

Upon this point Sir Joshua Jebb and Sir Walter Crofton, the great rival authorities in England and Ireland (whose opinions upon many other points are at variance), are perfectly agreed. The adoption of "solitary punishment" instead of the present utterly illusory sentence of "hard labour," would now be possible in many of our gaols in Canada. Until very lately indeed it would not have been possible in any. Four years ago, when the present Board entered upon its duties, there was not in the entire province, from Gaspé to Amherstburgh, a single gaol where it would have been practicable to enforce "solitary confinement." Now, however, there are ample means of enforcing this complete separation, not only in all the new gaols (about one-fourth of the whole), but also in a great number of the old gaols—in all those, in fact, in which alterations and additions have been made in accordance with the requirements of the law and the suggestions of the Board.*

To have earlier attempted the change now proposed would, therefore, have been premature, but it is submitted that there is no valid reason why the change should not now be made. It is, indeed, true that there are still some few gaols in both Upper and Lower Canada in which, from their defective construction, it would be impossible to carry out strictly the principle of "solitary confinement." But there does not appear to be any sufficient reason for not introducing the change of system in those gaols where "solitary confinement" could be really enforced. At the worst, even if "solitary confinement" were substituted at once in all our prisons in place of "hard labour," we should be much better off than at present, for the latter sentence cannot be enforced in one single gaol in Canada, whereas the former could be from the first enforced in a very large number of them. There would be this benefit, more

* In all the gaols above referred to, there is a certain proportion of the cells, generally about one-third of the whole number, termed "night and day" cells, which were intended by the Board to be used for separate confinement. These cells are as large as those now used in England for the same purpose, 9 feet long by 6 feet wide. See question 1002 in report of select committee of the House of Lords on prison discipline, for 1862.

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over, resulting from the immediate adoption of the proposed system of "solitary confinement" with shortened sentences in the gaols where the construction would allow of its being introduced, that the great economy of the new system as compared with the old would at once be made apparent, and municipal councils and other public bodies who cannot be persuaded to make the necessary alterations in their gaols from motives of humanity or morality might yet be induced to make them from motives of economy.

It is not necessary to discuss here at any length the question, which is merely one of detail, as to the time and manner of making the proposed change in our prison system. I shall merely remark in passing that it appears to me the change might be at once introduced into all those gaols which should be certified by the Board to the Government to be adapted for it, and that the remaining prisons might be from time to time proclaimed in the official Gazette as coming within the meaning of the Act, on its being duly certified to the Government by the Board that the necessary alterations had been made in them to adapt them to the purpose.

The system thus strongly recommended by the Committee of the House of Lords has indeed already been partially tried in England, and with the most satisfactory results. In 1839 an Act was passed (2 and 3 Vic., cap. 56) authorizing the separate confinement of prisoners during the whole or any part of their imprisonment in gaol. The following extract from the Report of the Inspector of Prisons for the Southern District of England,* for the year 1862, shows how well the Act has worked:

"It is very satisfactory to refer to the great and manifold improvements that have taken place in the construction and discipline in the prisons of England and Wales since the enactment of the Statute 2 and 3 Victoria, cap. 56, by which the separate confinement of prisoners, as contra-distinguished from solitary confinement, was first sanctioned by law. In the year 1843, when I had the honor to be appointed to my present office, there were two prisons only in the part of the country now comprised in the Southern District, in which advantage had been taken of the provisions of that Act. * * * * These prisons, at the time

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[illegible] an aggregate number of 300 [illegible] cells, whereas at the present time there are more than 8000 which have [illegible] in the same form of discipline. In [illegible] the change as evidence of the growing conviction of the advantages which have attended the adoption of separate confinement, it should be mentioned that more than nine-tenths of the cells so certified are contained in prisons expressly built for the exercise of this discipline, and the remainder have been obtained by alterations of existing cells, of so expensive a character that they would not have been undertaken without a strong conviction of the superiority of the form of discipline to be carried out in them."

The Inspector adds that the number of commitments to the prisons thus altered, rapidly decreased, and that in many gaols it was reduced to one-half what it had been ten years before.

The provisions of the Imperial statute just referred to, respecting the separate confinement of prisoners, leave the matter to the discretion of the local authorities. But the committee of the House of Lords, in their report, recommend "that legislative measures be taken as speedily as possible to render the adoption of separation obligatory upon all gaols and houses of correction in England and Wales, and that the payment of the proportion of the charges, now issued from the public revenues in aid of the county and borough prisons be made contingent, in each case, on the adoption of the separate system."

If the adoption of the "separate system" be necessary in England, where every gaol possesses in its chaplain, its schoolmaster, its system of hard labor—so many agencies to check or counteract the evil effects of the association of the prisoners, how much more necessary is such a system in Canada, where our gaols are without chaplains, without school-masters, without any means of providing labor for our prisoners, and where, consequently, the system of association of prisoners is left wholly unchecked to produce its sad and bitter fruits.

In conclusion, I would observe that the subject which I have ventured to bring under your notice thi[illegible] ne of no ordinary practical importance to society. I [illegible] ever, to a class of

social questions which have not, in my opinion, received adequate attention from the thinking and educated men in the community. It is mainly with the hope of awakening, in some degree, a personal interest in these great social problems among the members of this society, and through them in the public generally, that I have been induced to address you on the present subject. No important changes in our prison system are likely to be effected until those changes are demanded and supported by public opinion, and the first step towards creating this public opinion is to excite a personal interest in these questions among thinking men. It is the sum of personal interest, felt and expressed on such subjects by the intelligent minds of the community, which, in every free country, forms and moulds the character of public opinion; and it is this public opinion which ordains and shapes the laws and institutions of the land.

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PAPER IX.—THE ORDERS, SUB-ORDERS AND GENERA OF INSECTS.

BY WILLIAM COUPER,

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[Read before the Society, 20th April, 1864.]

THE animal kingdom consists of four great divisions, which are called *Departments*.—It contains about 250,000 species.

I. VERTEBRATA—Mammals, Birds and Fishes.

II. ARTICULATA—Insects, Lobsters, Crabs, &c.

III. MOLLUSCA—Cuttle-fishes, Snails, Clams, &c.

IV. RADIATA—Sea Urchins, Jelly-fishes, Polyps and Star-fishes

The ARTICULATA are animals whose body is composed of rings or joints. It embraces three classes:—

1. Insects.*
2. Crustaceans.
3. All forms similar to the earthworm.

The Insects include three *orders*:—

a. Manducata. Those which have jaws for dividing their food, consisting of wasps, bees, ants and ichneumon-flies; beetles, grasshoppers, crickets and dragon-flies.

b. Suctoria. Those with a trunk for sucking fluids. The various bugs, cicadae, &c.; butterflies and moths and the two-winged flies are examples.

c. Aptera. Those destitute of wings, of which the flea is a good example. Apterous genera occur also in *Manducata* and *Suctoria*. We find the first wingless parasites among the two-winged flies. In *Hemiptera* or bugs, some of the lower groups are wingless parasites, and the wingless lower genera

* Fully one hundred and fifty thousand have already been described.

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of *Neuroptera* present more analogies than other insects to the *Myriapods*.

The above three classes are also sub-divided into seven divisions, occupying an intermediate rank between orders and families, and called *sub-orders*.

The classification of old authors is as follows:—

1. *Coleoptera*—Beetles.
2. *Orthoptera*—Grasshoppers, Locusts, &c.
3. *Hemiptera*—Bugs.
4. *Neuroptera*—Dragon-flies, &c.
5. *Hymenoptera*—Bees, Wasps, &c.
6. *Lepidoptera*—Butterflies and Moths.
7. *Diptera*—Two-winged flies.

1. Beetles are known by their hard bodies, free and well-developed mouth parts, and by their first pair of wings being hardened into sheaths, which are termed *elytra*. They pass a complete metamorphosis to the *imago* or perfect state. Many of the species are aquatic. Beetles have been studied much more than other insects; in this country there have been described some 8,000 species,* but from the difficulty of finding their larvæ and carrying them through their successive stages of growth, the immature forms of but few native species are known. The family forms are easy to distinguish and characterize; the genera are based upon marked changes in the different parts of the body, which vary greatly, and some of the best characters lie in the relative size of the head-pieces and those pieces that make up the flanks of the three thoracic rings, and the basal joints of the legs. The relative size and the sculpture of the body and of the elytra; and lastly, the coloration, which varies

* The definition of "species" is one of the most difficult tasks assigned the Naturalist. It corresponds very nearly with the common term "sort," or "kind." It is that race or chain of beings, descended from common parents, and which always produces the same kind, or very nearly so. For instance, the white oak is a species, the black oak is another; and the acorn or fruit of one will not produce a tree of the other kind. Insects being small animals, great care is necessary to avoid confounding the species with another, or making two species out of one where the sexes differ. On the fact of the permanency of species hangs the entire system of classification. For if what is now a white oak may in a century produce a black oak, or a chestnut, and what is now a frog may in five hundred years produce a bird, a description given by Aristotle or Linnæus, would be of no service to us of this day. In fact, Natural History would cease to be a science.

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much among the individuals, afford good specific characters.

The most productive places for the occurrence of beetles are alluvial loams, covered with woods or with rank vegetation, where, at the roots of plants, or upon their flowers, under leaves, logs and stones, under the bark of decaying trees, and in ditches and by the banks of streams, the species occur in greatest numbers. Grass lands, mosses and fungi, the surfaces of trees and dead animals, bones, chips, pieces of board, and everything lying upon the earth that serves to attract insects should be searched diligently. Many are thrown ashore in sea-wrack, or occur under the debris of freshets on river banks. Many carabidæ run on sandy shore. Very early in spring stones should be upturned, ants nests searched, and the waters be sifted for species not met with at other times of the year.

The tiger-beetles abound in sandy roads and banks of rivers, where the rays of the sun have full play. They run swiftly and are also very excellent flyers. They are captured by throwing the bag-net quickly over them.

There are other ground beetles, called carabs, provided with powerful jaws, which are shorter and not so much curved as in the tiger-beetles. They are runners, the under wings being often absent. They run in grass, or lurk under stones and sticks, bark of trees, and in the debris of freshets, in the greatest number in spring. The following species are taken in the latitude of Quebec :—

Cymindis laticollis Say. Rare.

The beautiful little *Lebiini* are found in autumn on trees and tops of composite plants.

Lebia axillaris Dej. occurs in June, near the Hermitage.

Platynus retractus Lec. June—uncommon.

" *stigmosus* Lec. is found everywhere near Quebec.

" *atratus* Lec.

" *obsoletus* Say, common.

The genus *Amara* feeds on pith and stems of grasses. Others feed on wheat. *Amara avida* Lec. is very common in June. *A. littoralis* Zimm. is occasionally taken near Quebec. *Stenolophus conjunctus* Lec. is generally found under bark of trees—it is rather rare. *Patrobus angicollis* Randall is found during the month of

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June under stones on the margin of the Montmorenci river. *Elaphrus*, which is flat, and covered with coarse metallic punctures, runs on the mud flats of rivers. The larvæ of *Calosoma* ascends trees to feed on caterpillars. *C. calidum*, our common golden-spotted species, digs holes in fields, where it lies in wait for its prey. Another uncommon species, *C. frigidum*, occurs here, but its habits are not definitely known.

The *Dytiscidæ* or diving-beetles are, by their carnivorous habits, closely allied to the carabs. They are aquatic, flattened, elliptical beetles, with their hind legs ciliated, forming a broad surface for swimming. In night time they leave the water and fly about. The larvæ of *Dytiscidæ* are called water-tigers. The following species are taken in the vicinity of Quebec:—

Dytiscus hybridus Aubé.

Cnemidotus muticus Lec. This species has lately been described by Dr. LeConte, in the Smithsonian Misc. Coll., part I. His specimens came from the Middle and Western States; those in my collection are from ponds near this city. *Hydroporus rotundatus* Lec.—This insect is also described as new in the above work, by Dr. LeConte. The description is from a specimen taken by me at Toronto, ten years ago. It is common in ponds north of Quebec.

Hydroporus undulatus Say, taken with the above.
" *catascopium* Say.
" *modestus* Aubé.
" *puberulus* Lec.
" *tenebrosus* Lec. (var?)
" *similis* Kirby.
" *inæqualis* Lec.

Laccophilus proximus Say—not common.

Agabus fimbriatus Lec.—In ponds, Beauport.

Of *Colymbetes* but two species have been taken at Quebec. They belong to the third section *Cymatopterus* Esch. *C. sculptilis* Harris, and *C. binotatus* Harris.

The *Gyrinidæ* or whirl-gigs, are easily distinguished by their form and habits, being always seen in groups, gyrating and circling about the surface of pools, and when caught, giving out a disagree-

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able milky fluid. They are provided with two pair of eyes, two for looking into the water, and the others for ærial purposes.

Hydrophilidæ, also aquatic. They are small, convex, oval or hemispherical beetles, with short antennæ and long slender palpi. The larvæ are carnivorous, but when beetles, vegetable feeders, and living on refuse and decaying matter. This family unite the habits of the previous mentioned families with those of the scavenger beetles.

Tropisternus glaber Herbst.—In ponds, Beauport. *Hydrobius regularis* Lec., in ponds—common.

Silphidæ; carrion, or sexton beetles, are useful in burying decaying bodies, in which they lay their eggs. Smaller speciês live in fungi, &c.—other genera live in caves. The genus *Catops* lives in ants nests. Another genus, *Brathinus*, has been found from Lake Superior to Nova Scotia, about grass roots, in wet places. Dr. LeConte, of Philadelphia, says they are small shiny insects, of graceful form.

The *Staphylinidæ* or rove-beetles, which are of a linear form, with remarkably short elytra, are largely represented in Canada. Though sometimes an inch in length they are more commonly minute. They inhabit wet places, under stones, manure-heaps, fungi, moss, bark of dead trees and decayed leaves. Some burrow in sand. *Tachinus picipes* Er. occurs in fungi in July and August. *Staphylinus badipes* Lec. Lately described by Dr. LeConte as new. It appears to be common here; the latitude of Quebec may be considered its most northern range.

Histeridæ.—These beetles are square or oblong, hard, solid, shiny insects, black, with the prothorax hollowed out to receive the head, which has prominent jaws. They are found in similar situations with the last-mentioned family. *Hister merdarius* Paykull is common in August.

Dermestidæ.—Every entomologist dreads the ravages of *Dermestes* and *Anthrenus* in his cabinet. The ugly insidious larvæ which so skilfully hide in the body whose interior it consumes, leaving only the shell, ready to fall to pieces at any jar, can be kept out only with great precautions. *Dermestes lardarius* is oblong oval,

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legs short, black, with the base of the elytra gray buff, covered by two broad lines. It is timid and slow in its movements, when disturbed seeking a shelter, or mimicking death. *Anthrenus musæarum*, is round, oval, with transverse waved lines. Its larvæ is thick, with long bristles, which are largest on the ends of the body. They eat, also, the integuments of stuffed specimens, doing great injury. Boxes and drawers should be tight enough to keep them out, or it may be done with camphor or benzine in a sponge or in cotton.

Ips sanguinolentus Say is common in mucus on birch, in May.

Peltis ferruginea Kug. Very rare.

Peltis quadrilineata Mels. In trees, June and July.

Thymalus fulgidus Er. May, in fungi—rare.

Cucujus clavipes Fabr. Rare.

Laemophlocus biguttatus Lec. Rare.

Mycetophagus flexuosus Say. Common in bones.

Attagenus pellio Steph. Common.

Thanasimus undulatus Say.

Byrrhus also occurs in Canada. We generally find them in fields, under stones, &c. When disturbed they counterfeit death. *Byrrhus americanus* Lec. is very common in May and June on the Beauport road.

Scarabeidæ or Lamellicorns are of great interest to agriculturalists, from the injury they do as leaf-eaters. They are distinguished by their lamellated antennæ, short, broad, thick convex form; their legs are flattened, and toothed for the purpose of digging. The males are often armed with horns on the clypeus. Among them occur the largest of insects. *Lucanus* has immense jaws, especially in the males. The larva forms a cocoon of the chips it has made in boring into decayed trees. In Canada, this genus is, as far as yet ascertained, confined to the West. *Aphodius terminalis* Say. is found in the Quebec district.

Melalontha and allies are leaf-eaters, which have long clawed legs to cling on to leaves, where they are found early in summer. Their larvæ eat the roots of grass, and before transforming form oval earthen cocoons. *Macrodactylus*, the Rose-beetle, is found on roses and rhubarb blossoms, in gardens; but, fortunately, it does

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hot obour in the Lower Province; but *Lachnosterna*, an allied genus, which does much injury to apple and cherry trees, is abundant about the woods near this city. *Trichius affinis* Gory is common on flowers during June and July. *Dichelonycha linearis* Schönh is found on trees in June.

Buprestidæ.—Beetles with elongate, flattened, very solid bodies, often angulated; the antennæ slender and serrated, legs short—the head is received into the excavated prothorax. Colors brilliant, often metallic. On being disturbed they draw up their legs and feign death. They creep slowly, flying in the hot sun, and feed on wood, flowers and sap; being found especially on fir trees. A great many species are found in Western and Eastern Canada; they are considered very destructive to various trees.

Elateridæ or snapping-beetles, are known to many by their power of righting themselves when turned on their backs, by jerking themselves up in the air, since their legs are too short to catch hold of the surface they are upon. They frequent the flowers of viburnum, of rhubarb, in gardens, and are found under bark. Their larvæ are called *wire-worms*, from their long, cylindrical form. They feed on the roots of grass, grain, turnips, salad, cabbages and pinks, living in the interior of these stems. Moles devour great quantities of them. Other species inhabit rotten stumps. They live several years in the larva state. The following species were determined since my former list was published:—

Elater apicatus Say.—Quebec. May.
Cryptohypnus ? planatus Lec. June.
Corymbeles spinosus Lec. June.
" *nitidulus* Lec. May.
" *medianus* Germ. June.
" *falcificus* Lec.
Sericosomus incongruus Lec. June.
Dolopius fuscosus Lec. June.
Photinus (Ellychina) *lacustris* Lec. Quebec. June.
Silis percomis Say.
Podabrus modestus Say.
Telephorus excavatus Lec.

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Meloidæ.—This and the following family are most interesting, from their parasite habits, and demand careful study and observation. *Meloe angusticollis* is an inch long, thorax very small, square; the elytra are small and oval. It feeds on grass in the spring, in the summer it is found in the neighborhood of Quebec, feeding on *Clintonia borealis.* The larva is very different from the beetle, and as found parasitic on wild bees, resemble larva of some Staphylinidæ, being oblong, flattened; the three thoracic rings above of nearly equal size, transversely oblong; the head nearly of the same size, with short antennæ; the legs have very long claws, with an intermediate long pad; they are found living on bees, between the joints of the head and thorax, their heads immersed in the dense scales of the bee. In Europe, this genus has been found parasitic on a beetle of the genus Cetonia. Our beetles, related to the latter, should be searched for them. The eggs are laid on the ground, and the active larvæ attach themselves, soon after hatching, to bees and to various two-winged flies.

Cantharis, and our *Epicauta* secrete cantharidine, of use in pharmacy. *E. atrata* is found in abundance on Golden rod, and it is perfectly black, with long elytra. *Epicauta atrata* has been very destructive in the Quebec gardens during the months of June and July of this year. They were never known to be so abundant before.

Cephaloon lepturides Newm.—Quebec. Rare. *Ripiphorus* is parasitic on the wasp; *Ripidia* on *Blatta Americana,* the cockroach. *Myoditini* is represented in this district by two species not yet determined.

Calopus angustus Lec. June—rare. Dr. LeConte says that Quebec is an extrordinary locality to find this insect. The only one in his cabinet came from New Mexico. It is possible that *Stenotrachelus arctatus* Lec., a genus of somewhat similar shape, may be found at Quebec.

Curculionidæ.—This group is at once recognized, by having the head lengthened into a long snout, near the middle of which are situated the elbowed antennæ. Their bodies are hard and round, and often very minute in size. The beetles are very timid, and

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quickly feign death. The larvæ are white, thick, fleshy, legless grubs, with tubercles instead of wings, and armed with thick, arched strong jaws. They feed on nuts, seeds, the pith of plants, leaves or flowers; while some are leaf-miners, and others make galls. Before they transform they spin a silky cocoon. *Bruchus pisi* lays its eggs in the pea, when in flower, and lives in the pea till the following spring. *Brenthus* inhabits the solid trunks of oaks. *Apion* inhabits the seeds of clover. *Hylobius pales* is found under the bark of the pine, and lately I have discovered and described another large species inhabiting pine, which I have named *pinicola*. The pine is also infested by a weevil *Pissodes strobi*, where it occurs in all its stages. *Rhynchænus nenuphar* infests the plum. *Calandra granaria*, the grain weevil, is an eighth of an inch long, and consumes the interior of wheat. *Balaninus* forms galls on the willow. *Scolytus*, *Xyloteres* and *Tomicus* are cylindrical bark-borers, and the pines of our forests are being largely destroyed by them—"they form gallaries in the bark or sap-wood, often causing the disease called fire-blight."

Cerambycidæ.—The longicorns are insects with long bodies, tapering behind; the elytra broader than the prothorax; the antennæ and legs are long, and are large, handsome beetles, often gaily ornamented. They fly in hot days about woods and timber. All the insects of this family are wood-borers, and found in trunks of trees. The following are additions to the Quebec list:—

Callidium ligneum Fab. Rare.

" *janthinum* Lec. June—rare.

Heliomanes bimaculatus Say. Rare—Quebec, June 20th.

Liopus maculatus Hald. Gomin woods, July.

Leptura (Grammoptera) *sphaericollis* Say.

" *lineola* Say. June—common.

Donacia, which approaches the *Cerambycidæ* in its elongated body and long antennæ, lives, as a larva, in the stems of aquatic plants. There are several species inhabiting the Quebec district, but *D. emarginata* Kirby is the only one as yet determined. They frequent swampy places.

Chrysomelidæ.—The insects of this family have hemispherical

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or oval convex bodies, with small heads sunken in the thorax, and live, in all their stages, on the leaves of plants.

Orsodacna vittata Say. (Var.) June.

" *Childreni?* Kirby. June.

Anoplitis rosea Weber. June—Gomin woods. The Northern specimens are smaller than those taken in the West; the form is so reduced that an inexperienced eye would take it for a new species.

Hispa (Microrhopala) *Pluto* Newm. At the Hermitage, June—rare.

H. (Microrhopala) *Xerene?* Newm. Taken with the former.

Lema trilineata, which closely resembles the squash beetle devours the leaves of the potato.

Phyllotreta striolata Illig. is sometimes abundant at Quebec.

Cassida is also a vine-leaf eater. *Hispa* is a leaf miner, its minute larva making galleries in the leaves of the apple tree and wild cherry. *Galeruca vittata*, the squash beetle, is yellow, with black stripes. *Haltica*, or flee-beetles, are little, black-colored, most hurtful insects, which destroy young tomatoes, turnips, &c. Several species of *Calligrapha* are found on alders; they are oval, and richly ornamented with dots and curved lines.

Chrysomela viridis Mels. On the margin of ponds in May—common.

Chrysomela (Helodes) *trivittata* Say? var? The Quebec insect comes near several European species.

Pachnephorus 10-*notata* Say. Uncommon.

Chelymorpha cribraria Fabr. June—rare.

Galeruca rufosanguinea Say was very common here on plum and choke-cherry trees, during the summer of 1864.

Luperus meraca Say. Common at the Hermitage, June.

Cryptocephalus mutabilis Mels. A beautiful variety of the insect was taken at the Hermitage, in June.

Coccinellidæ (Lady-bugs).—They are hemispherical, generally red or yellow, with round or lunate black spots. *Chilocorus* is black, with yellow dots. The eggs are laid often in a group of plant lice (Aphides); as soon as hatched the larvæ devour them. When about to turn to pupæ they attach themselves by their ter-

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minal rings, to the leaf they are upon. The beetle is as voracious as the larva. In Europe, gardeners take pains to collect and put them on trees infested by lice, which they will soon remove. We have about fourteen species in Canada.

Coccinella tricuspis Kirby. I obtained two or three specimens of this beautiful little beetle at the Hermitage—June.

Coccinella trifasciata Linn. Gomin woods—July.

Pystloboro 20-maculata Say. June—common.

Phymaphora pulchella Newm. Found under the bark of trees on the 24th May.

Emmesa labiata Say. June—rare.

Mordella scutellaris Fabr. Gomin woods—June and July.

Every collector should keep a daily diary of his captures and observations, noting down every fact and hint that falls under his notice. In this book, commenced as soon as the season opens in the spring, can be placed on record the earliest appearance, the time of greatest abundance, and the disappearance of every insect in any of its stages. Also, a description of larvæ, and observations upon their habits, with sketches of them; though drawings had better be kept upon separate pieces of paper, for easier reference. The insects, when captured and unnamed, should be numbered and refer to corresponding numbers in the note book. At the close of the season one will be surprised to see how much material of the kind has accumulated. He can make a *calendar of appearances* of perfect insects and larvæ, so as to have the work of the next season portioned out to him; he will thus know when and where to look for any particular insect or caterpillar.

A sweep-net must be employed to collect the minute species. Strong brass wire makes the best ring for this net; then a bag is made of linen or Berlin-wool canvass to suit the size of the ring, which is attached to the stick by means of a screw. The ring is hinged in the centre for the purpose of being more portable, and the ends are bent round and flattened, so that one end sits on the other on the top of the stick. I use but one ring for the sweep-net and butterfly-net; they can be carried in the pocket and used as required. The water-net is generally smaller, and shallow. It is

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made of various material, such as grass-cloth, coarse millinet, fine brass, concave, and full of small holes. Aquatic beetles can be fished up in mud, which will strain through the net, leaving them to be picked up. For beetles, a collecting bottle is necessary—one with a wide mouth is best; it should have a good cork, and it is better to encase it in tin to prevent its being broken. The bottle should be half-filled with fine pine sawdust, previously baked in an oven, to destroy any vegetable moisture; the sawdust is then moistened with spirits of wine or good alcohol, and it is then ready for use. After an excursion, the contents of the bottle are emptied out on a piece of white paper, and the new captives selected therefrom, mounted on pins suitable to the size of the insects.

2. Grasshoppers and crickets have the mouth parts free, and the organs of nutrition very highly developed. The first pair of wings are still partly hardened, to protect the broad net-veined hind pair, which fold up like a fan underneath them. Their transformations are not complete, the *larva* and *pupæ* resembling closely the *imago*, both being active. All the species are terrestrial.

"The transformation of grasshoppers need careful study. For this purpose their eggs should be sought for, and the development of the embryo in the egg be noted; the date of deposition of the egg; the manner of laying them; how long before the embryo is hatched; the date of hatching; how many days the pupæ lives; also, so of the pupæ and of the imago; while the intervening changes should be carefully observed. Birds feed on them in all their stages. Ichneumon parasites prey on them, and also the lower worms. Orthoptera can be easily preserved in strong alcohol, and can afterwards be taken out and pinned and set at leisure. They can be killed with ether or benzine without losing their colors. Many of the species can be collected in the same way as Coleoptera; they are both numerous and destructive in Lower Canada, but, up to this instant, nothing has been done to collect them and study their habits.

The different sounds produced by crickets and locusts should be carefully studied; every species can be distinguished by its peculiar note; and as in different families the musical apparatus varies

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so each family has a characteristic chirrup, or shrilling, or harsh, grating, rasping noise.

3. Bugs have the mouth part formed into a sucking tube. The first pair of wings are often thickened at the base, net-veined at the apex, and laid flat or inclined upon the body. Transformations incomplete. The species are largely aquatic Some of the lower groups are true wingless parasites.

Aquatic species should be taken out by the water-net, by thrusting under swimming species, or pushing it among submerged grass or weeds, where small species are lurking. Several species of small size are found lurking under logs, &c. in the water. By sweeping grass or herbage, as for Coleoptera, in the last part of the summer, arge numbers occur, which can only be obtained in this way. Hybernating species are found under leaves, in hardwood forests The large carniverous kinds are found on bushes frequently, with Lepidopterous larva transfixed in their jaws. All *Hemiptera* should be pinned through the distinct triangular scutellum, in the middle, at the base of the wings.

4. Dragon-flies have the mouth parts free; the wings large and net-veined, the hind pair being often larger than the primaries. Their bodies are more elongate than those of other insects. The metamorphosis is incomplete; the larva and pupæ closely resemble the perfect insect, and both are active, and, with few exceptions, they are all aquatic. The different species present strong analogies to all the other sub-orders. They occur in swampy, low grounds, the banks of pools and rivers, and sometimes in thick, dense forests. The large dragon-flies, when taken with the net, must be killed, by brushing the body with alcohol or benzine, carried in a vial, and then the wings can be folded together, and the insects be placed in bags, or pieces of paper. The smaller, more slender and delicate species should be pinned directly in the collecting box.

Distribution of the Northern Species.

	Species.
Greenland	6
Arctic America	29
Russian Colonies	7

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Canada	100
Labrador	6
Nova Scotia	33
Massachusetts	27
New York	104
Pennsylvania	65

North America contains 716 species.
South America " 507 "

Deducting 53 species found in both North and South America, the whole Continent contains 1,170 species.

5. Bees and wasps are known by their hard, compact bodies, distinct head and thorax, the small narrow wings, irregularly veined, and by the possession of a hard ovipositor, often forming a poisonous sting. Their transformations are the most complete of all insects. The pupa has the limbs free, contained in a thin silken cocoon. The species are all terrestrial. Dana, in the "Am. Jour. of Science and Arts", vol. xxxvii., states that "the structures among bees, wasps, &c. are compact, comparatively uniform in proportions, and with rather narrow limits as to size, much narrower than in the butterflies, beetles and grasshoppers. In bees, the integuments are firm, the parts neatly adjusted, and all well proportioned. Among them there is no imitation of the forms of other tribes, while they are extensively copied after—a characteristic peculiar to a type of the very highest grade. The mouth has a suctorial lip for feeding; but besides this, well-developed mandibles; and these serve, in many species, for the high purposes of making nests, taking prey, and transporting young and food. The jaws are therefore *per-functionate* in these species, to a degree comparable with that of the jaws of a carnivore among mammals. The higher kinds also supply the young with food, either by storing it or by direct feeding—a quality approximating to that of the Altrices (nursers), or highest sub-division of birds. The food is either vegetable or articulate-animal, not vertebrate-animal; the animal food being thus the same in kind with the material to be made of it, just as among *mammals*, the highest of carnivorous species live on the flesh of mammals, and only the lower on fish and insects. Individuals of many of the

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higher species live in communities, for mutual work, and with sometimes a special division of the work between them. The wings are fitted eminently for the legitimate purpose of flying, and are typical in size, texture and power." The Hymenoptera are the most numerous in species of all the sub-orders, except Coleoptera. They have been less studied in this country than almost any other sub-order, though so deserving, from their interesting habits. Especial attention should be paid to collecting the smaller species. They should be pinned through the hard thorax, high up on the pin. Their habits should be studied long and patiently, and attention be given to rear in the same way as given for butterflies and moths. Great attention should be paid to the collecting of galls on various trees.

6. Butterflies and moths have the mandibles obsolete, the maxillæ greatly prolonged and rolled up between the labial palpi; and soft bodies, covered with dust-like scales. Their transformations are complete. The caterpillars (larvæ) spin silken cocoons before changing to pupæ (chrysalides), with the exception of the butterflies. Some of the families are somewhat aquatic, feeding on water-plants.

A few of our butterflies have been introduced into this country by commerce, from Europe. The *Vanessa antiopa* is double-brooded, common, and a hybernating species in Canada, while it is rare in England, where it is called the Camberwell beauty. The caterpillar feeds on our willows and elms. Another species, supposed to be the *Pieris rapæ* of Europe, is one of the most common butterflies in our neighborhood. Four years ago, I captured the first specimen of this butterfly in Quebec, and then looked on it as a great rarity; but, unfortunately, I cannot do so now. In England it is called the turnip butterfly, where it appears at the end of April or middle of May, and beginning of July or middle of August, therefore the species is double-brooded in England; and, as far as I have studied the introduced butterfly, it is the same with us Here, it appears to have discarded its British food-plant and taken to our cabbages; and the chrysalides can be found now on any garden fence where cabbage was cultivated last summer. It would

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be very interesting to ascertain how far this butterfly has penetrated the country. Westwardly, it has not reached Montreal, and it has not been traced south of Point Levi; eastward, it has not been taken at St. Anne's, where a Lepidopterous collector resided during the time of its occurrence here; north-west it appears to have made the greatest inroad, for it has been noticed at a distance of thirty miles in that direction. I am safe in stating that five years have not elapsed since this butterfly was introduced into Lower Canada, and it is now brought before the public as an unprofitable addition to our insect fauna.

Butterflies are easily distinguished from the other groups by their knobbed antennæ; in the *sphinges* and their allies the feelers are thickened in the middle; in the *moths* they are filiform, and often pectinated, like feathers. Lepidoptera have also been divided into three large groups, called Diurnal, Crepuscular and Nocturnal, since butterflies fly in the sunshine alone, most sphinges in the twilight (many of them fly in the hottest sunshine), and the moths are generally night-flyers—thus showing that the distinctions are somewhat artificial. In collecting them to pin dry, we must remember that the least touch will remove some of the scales from the wings and bodies, thus injuring them for study and spoiling their looks. The collector should have the gauze net, a box lined with cork, to pin his captures into. A piece of sponge, saturated with benzine, and pinned at the bottom of the box, will produce a strong odor, and prevent the specimens from fluttering. When the insect is taken in a bag-net, by a dexterous twist of the handle, which throws the bottom over the mouth, it should be confined with the other hand, with great care, and then pinned through the thorax when in the net. The pin can be drawn through the meshes upon opening the net. The collector can afterwards set his specimens to his own fancy. The catalogue published by the Smithsonian Institution enumerates over 2,000 species.

7. The two-winged flies, the house-fly for example, have the mouth parts formed into a kind of probosis; the second pair of wings are undeveloped, being reduced to a pair of pedicelled knobs, serving as *balancers* or *poisers*. Their transformations are complete.

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Many of the species are aquatic. Here we first find the wingless parasites.

To this sub-order belongs the cecidomya or midge, so destructive to wheat. The entomologists of the United States have estimated by careful calculation, the loss of cereals in the Western States, by the devastations of insects, at one hundred millions of dollars per annum. The insect armies that invade our fields are more to be dreaded than an army of foreign mercenaries. The utility of a study that will lead to the investigation of the character and habits of insect life, in order to facilitate their destruction, either by destroying their larvæ or in increasing their natural enemies, is apparent. These insects are very insignificant individually, yet, when they invade our fields, the hopes of the farmer are dissipated, and his labor destroyed. Surely, if there is an antidote to such mischief, it would be useful to know and apply it.

Mr. Dana places the *Diptera* immediately after the bees and wasps, because the anterior locomotive organs have their normal superiority. Flies can be pinned alive, without killing them by pressure, which destroys their form; and numbers may be killed at once by moistening the bottom of the collecting box with creosote, benzine, or ether.

The entomologist should not neglect to collect insect architecture. Many important discoveries are made by tracing the insect to the plant. Galls on oaks, currants, rose, raspberry and other plants should be secured, and a note made of the time. The specimens must be placed in separate boxes, that the insects producing them may be determined. Leaves of trees, mined or otherwise deformed by the larvæ of insects, such as moths and two-winged flies, should be carried home and treated in the same way; this is the most correct mode of ascertaining the natural history of insects. Bees, wasps, and ichneumon-flies are good architects, and many very pretty specimens of their work are to be found in Canada. Caterpillars of moths construct neat habitations, in which their chrysalides rest during winter. Indeed, all insects, while in their second stage of metamorphosis, produce some kind of protective building for its future form. Spiders are ingenious architects and good

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mathematicians. I have collected many pretty specimens of their work in this country.

"The double effect of the study of entomology is to impart a certainty to the mind and religion to the heart. The creation is a visible ladder by which man ascends to the invisible creator. Philosophy, politics, history, and morality itself, are subject to the intellectual revolutions of wavering humanity; but the facts of the creation are as invariable as God, and the analysis of a plant or an insect marks its demonstration with the seal of eternal truth." Children are liable to be cruel and tyrannical when no direction is given to their minds. Give a boy a gun, and he will slaughter every living animal that is not the subject of property, without discrimination. without compunction or remorse. He kills for the sake of killing; and the dying agonies of a wounded sparrow excite no sympathy, no regret. Think you that if a companionship had been established between him and living things; that he had learned their value in the scheme of creation; their uses in the economy of nature; their beauty, their innocence, their helplessness, that he would thus destroy them for mere wantonness? We know, from observation and experience, that there can be a softening, humanizing influence brought to bear upon youthful minds through a correspondence and communion with nature's works. Those who are interested in birds and flowers must be refined by the association. An intimate connection with the varied works of creation leads the mind from vicious associations, and preserves it from contact and contamination. The man or woman educated to observe and reflect upon the condition of natural objects, can never be alone—will never want companionship. Under circumstances where others would be miserable and lonely, the naturalist may indulge in sweet, though silent, communion with nature, and look "through nature up to nature's God."

I am indebted to A. S. Packard, jun., Esq., of Brunswick, Maine, for useful hints and extracts relating to generic and specific definition.

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PAPER X.—LATITUDE OF THE OBSERVATORY.

BY LIEUTENANT E. D. ASHE, R. N., F. R. A. S.

[Read before the Society, 5th May, 1864.]

THE many advantages and accuracy of results in obtaining the Latitude, by placing a transit instrument in the prime vertical, induced me to prefer that method to any other.

A small transit instrument of 24 inches focal length, by Simms, was placed nearly in the prime vertical; the place of observation was immediately to the northward of the transit room, in a temporary wooden building erected for the purpose.

The assistant, Mr. Heatley, was the observer and computer.

A mean-time chronometer; that beat half-seconds, was placed upon a table near the transit instrument, and the beats could be distinctly heard when taking the observations, with but few exceptions, when the noise common to a barrack-square interfered.

The level was always applied, and the chronometer compared, both before and after each observation.

Observations were taken with the instrument in reversed positions, and the same star taken generally east and west, and the star was also taken as it passed the meridian by the transit instrument of the Observatory; and always a sufficient number of clock-stars were taken to insure the angle Z, being known to a tenth of a second. When this formula was used.

$$\text{Tan}\,\Phi = \frac{\tan\delta + \cos Z.}{\text{Cos}\ \tfrac{1}{2}\ \text{time elapsed.}}$$

Where Φ=Latitude, and δ declination of star.

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By reversing the instrument any error of collimation, or inequality of pivots, will produce exactly a contrary effect on the Latitude; and it is presumed that the Latitude of the Observatory is determined with as much accuracy as the declination of the stars are known.

The stars selected are taken from the B. A. C., 1850, Nat. Alk. and Radcliff Cat., and out of 15 stars with lamp N., and 10 stars taken with lamp South, there is a range of only 1″. 3 in the means.

RESULT OF OBSERVATIONS FOR THE DETERMINATION OF THE LATITUDE OF THE QUEBEC OBSERVATORY.

Star's Name.	Position of Lamp.	Date of Observation.	° ′ ″	Mean of Each Set.
				° ′ ″
i Herculis.....	N.	3rd August, 1863	46....48...22...5	
Do	N.	4th do do	46...48...21...0	46 48 21 5
Do	N.	6th do do	46...48...21...0	
α Cygni.....	N.	21st do do	46...48...21...0	
Do.	S.	28th do do	46...48...20. .3	
Do.	S.	31st do do	46...48...21...2	
Do.	N.	20th October, do	46...48...21...5	46 48 21 0
Do.	N.	26th do do	46...48...21...8	
Do.	N.	29th do do	46...48...20...5	
ϱ Cygni	N.	26th August, do	46....48...21...6	
Do.	S.	27th do do	46...48...20...5	46 48 20 2
Do.	S.	31st do do	46....48...18...5	
o^2 Cygni.....	S.	27th do do	46...48...21...6	
Do.	S.	28th do do	46....48...18...0	
Do.	S.	31st do do	46....48...18...5	
Do.	N.	20th October, do	46....48...20...6	
Do.	N.	26th do do	46...48...21...0	46 48 20 2
Do.	N.	27th do do	46...48...22...1	
Do.	N.	29th do do	46....48...19...6	
16 Lyrae.....	N.	10th Sept'r. do	46...48...22...0	
Do.	N.	16th do do	46...48...23...0	
Do.	S.	28th do do	46...48...21...?	
Do.	S.	29th do do	46...48...20...5	46 48 21 2
Do.	N.	30th do do	66...48...20.. 5	
Do.	S.	1st Novemer., do	46...48...20...0	
Lat of Oservt'y. Mean.....	....	....	....	46 48 20 8

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TRANSACTIONS

OF THE

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no. 3

Literary and Historical Society

OF QUEBEC.

SESSION OF 1864-5.

NEW SERIES.—PART 3.

Quebec:
PRINTED BY HUNTER, ROSE & CO.
1865.

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TRANSACTIONS

OF THE

Literary & Historical Society

OF QUEBEC.

SESSION OF 1864-5.

PAPER I.—OPENING ADDRESS.

BY JOHN LANGTON, M.A., PRESIDENT.

(*Read before the Society, 21st October,* 1864.)

IN addressing you at the opening of the present session, I find very little in the condition and prospects of the Society which calls for any special remark. No great calamity has befallen us which I may ask you to lament with me; nor have we met with any such signal success as to afford a subject for special congratulation. We have advanced, during the past year, evenly, but prosperously on the whole, and our history is written in our Transactions, our list of members and the Treasurer's balance sheet, and in the Catalogue of our Library which lies on the table. Were it not that the first term of our agreement with Morrin College approaches its termination, there would be nothing immediately connected with ourselves to which I need call your attention; and upon this subject I have only to remind you, that before the first of May next, the two bodies must decide whether our present connection is to

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subsist for another term of three years, or whether we are to prepare ourselves for other arrangements.

Under these circumstances I have selected, as the subject of my opening address, a question of the deepest interest indeed to us all, as members of the community, but with which, as a Society, we are only remotely connected. I propose to offer some general remarks upon Education, and especially with the view of considering their bearing upon the educational institutions of Canada.

The subject is far too extensive and complicated a one to be treated of in all its details within the limits to which I am necessarily confined. In the fullest sense, it not only embraces intellectual culture, which is the more popular acceptation of the word, but the physical, moral and religious, æsthetic, and I may add, social and national training of youth, so that all the qualities, which enter into the composition of that complex creature man, may receive their full development, and that he may be fitted to take his allotted place in society, and use all the powers with which nature has endowed him to the greatest advantage for himself and his fellow-creatures. All of these branches of education possess peculiar features of their own, to exhibit which, even cursorily, would expand my remarks into a treatise, which would be unsuitable, both in its limits and its matter, for an address to a mixed audience. Without ignoring, therefore, the importance of the other branches, which all necessarily react upon and modify each other, I shall confine myself upon the present occasion to the intellectual training, which it is the object of a sound system of education to promote; and I shall not presume, in deference to the ladies present, to offer any opinion as to the exact period of the general educational course, at which their peculiar duties in life, and perhaps even the natural tendencies of their minds, may point out the necessity of their branching off into a separate course of study in institutions designed for their special cultivation. By thus confining myself to the intellectual training alone, I shall escape some of those points which have given rise to the greatest amount of discussion, and the conscientious difference of opinion upon which has unfor-

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tunately had the effect, in most countries, of retarding the adoption of any general national scheme, which all are nevertheless anxious to promote. I would willingly also avoid another vexed question—the relative advantages of different methods and courses of study; but the subject is so intimately connected with the organization of any general system of schools, that it cannot be passed over.

I was led, upon a former occasion, to discuss the twofold aim which should never be lost sight of in education—the imparting practically useful information on the one hand, and the developing and training the intellectual powers on the other, so that habits of thought may be induced which will be applicable to all subjects, upon which those powers may hereafter require to be exercised. I then expressed an opinion that, as usually happens in controversy, the advocates of each system had laid too much stress upon their own favorite view, to the exclusion of the other side of the question, and that both objects must be kept ever present in the mind of any sound educationist. I still think that this is the most important consideration for every framer of a national scheme of education, and, at the same time, it is one of the greatest difficulties which beset his path. If all men were nearly alike in mental gifts and in worldly position, the question would be comparatively a simple one; but a truly national scheme of education must adapt itself to all ages, to all classes of society, and to all grades of intellect. In the same school, and often in the same class, will be found boys whose ultimate destinations in life will be most diverse; and the one may be about finishing all the education which the circumstances in which he is placed will permit, whilst the other has hardly entered upon the course of study which is laid out for him. Yet both must, almost of necessity, be taught from the same books, and by the same methods. To keep the two aims in view, each in due subordination to the other, under such widely different circumstances, must be a problem of the greatest difficulty; and like most social questions, it can only be approximately solved by a compromise. It is thus that the double object of education—the training of the mind and the imparting of positive knowledge—has

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such an important bearing upon the organization of our school system.

A general scheme of education to meet the wants of the whole nation should embrace, at least, six classes of institutions, whose objects are very different, and into which the two elements of education enter in very different proportions.

1. Primary schools—Excluding altogether infant schools, which can only be successfully established in towns, and are only imperatively called for by peculiar states of society, and then hardly fall within the region of intellectual education which alone I am considering,—the first duty of the State is to provide schools, in which every child, whatever its station in life, may obtain at least the rudiments of education. I say it is distinctly the function of the State to provide such schools, not only because the classes who principally take advantage of them compose the great bulk of the population, but because without the aid of the State they would frequently lack the means, and too often even the inclination, to maintain them, and because they would certainly be deficient in those comprehensive views, which are necessary to ensure their being established and conducted upon a sound and judicious basis. These schools afford the beginning and the end of all the education, which more than nine-tenths of the population will ever seek for, or be able to obtain. They may, indeed, form for some few the commencement of a course to be pursued elsewhere; but this is only a secondary use to which they are put. They are emphatically the people's schools, and all other considerations ought to yield to making them perfect for the object for which they are designed. Here the great mass of the people are to acquire all the positive knowledge which is ever to be taught them; and here all the systematic intellectual training they will ever be subjected to must be provided for, so as to fit them to make the best use of their knowledge, and to take advantage of any opportunities of further improvement which may occur. Labor for their daily bread being the lot of most of them, the time during which they can profit by the school is generally very limited. Reading, writing, arithmetic,

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and a reasonable correctness in the use of their own language, is usually the sum of actual acquisitions which they can carry away with them; and such other studies as may be prepared for them should be selected as much with the object of forming their character, as of storing their minds with useful facts. It would be out of place for me to enter into detail of the subjects which might be so employed; but I shall return to the question hereafter, when treating of another branch of the subject.

2. Another class of schools, which we may call secondary, is almost equally essential, in which a more advanced education may be placed within reach of those who are able and willing to take advantage of it. In towns and thickly-settled localities this object will generally be best attained by a distinct institution, but the higher classes of a primary school may be made to accomplish the same end. Such schools, being the final step in the education of the great majority even of the middle classes, the practical utility of the knowledge acquired is of as much importance as the mental training undergone during the study. The increased length of time over which the schooling extends affords an opportunity for the introduction of many subjects, which would be out of place in a primary school; but whatever studies be selected, care should be taken that, within the period of the ordinary course, the knowledge of each which is acquired should be tolerably complete. There is a natural desire to embrace in the course as many as possible of the numerous ramifications into which modern knowledge extends, each of which has strong claims upon us, both for the importance of the facts to which it relates, and for the useful lessons afforded by the manner of arriving at them; but if too large a field be laid out for our operations, the result is apt to be a mere smattering and fragmentary acquaintance with the facts, and a knowledge of technical words and phrases which have left few traces behind in the cultivation and enlargement of the mind. It is far better, both for actual use and also as a mental exercise, to have acquired a few things well, than to have skimmed over the surface of an extensive programme of study.

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3. These two classes of schools should, I think, be provided for by the State, although not to the exclusion, in different proportions perhaps, of contributions towards their support by those who use them. Another class, whose proper functions are very different, though it is often, more or less, confounded with the preceding, being more limited in its objects, may be made more exclusively to depend upon voluntary contributions. They may be called higher preparatory schools, and a junior division may be made, for those who frequent them, to supersede the ordinary primary schools. The proper function of such schools is neither to commence with the rudiments, nor to complete, as far as it is to go, the education of their scholars. It is to pave the way for further study, if not always in a regular collegiate course, at least in a learned profession, or for those classes who have leisure and opportunity, after leaving school, for carrying on their studies to a more advanced stage. The fact that it is not designed to be a final stage has an important bearing upon the subjects which may appropriately form part of the course. Many branches may not be pursued as far as in the secondary schools, and others may make a prominent part of the programme, as laying the foundation for future progress, which it would be useless to commence in the others. The training may also be a more prominent object, the fruit being to be reaped hereafter.

4. The universities and other collegiate institutions form a fourth class; and here again, the intervention of the State is almost essential. The subjects embraced in the programme must be diversified and numerous, or the institution will lose half its value. Not that it is necessary or even advisable that any one student should attempt too great a variety of studies; but an opportunity should be afforded to all, at some period of the course, to branch off and to devote themselves more particularly to those subjects, which either commend themselves to their peculiar bent of mind, or are most important for the pursuits which are to form the main business of their after lives. We must remember that we are no longer dealing with boys, but with men, and that the

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training, which it has been the aim of previous studies to perfect, must now, if ever, make itself manifest in its results. Where such a large field is to be embraced, the professors must be numerous, and they must be able and adequately remunerated. The buildings also, and the library, museum and other appliances must be of a more expensive character than is required for minor institutions; yet the numbers who frequent the higher seminaries of learning are not so great, that the institution could ever be adequately supported by their contributions alone. There must necessarily be a large independent income from some source; and until a country is sufficiently advanced to have accumulated wealth in the hands of individuals, and until it is old enough to have produced a succession of men, who are both wealthy, liberal and enlightened, and who have no immediate claimants for their acquisitions (a concurrence of conditions which is not likely to be frequently repeated), private munificence will hardly furnish the necessary means. If the colleges—the crowning point of the educational scheme—are to be really efficient, the State must come in aid of other sources of income.

5. These four classes would comprehend everything that is essential to a general system of national education, as it is usually understood; but there are besides special schools, whether for exceptional members of the community—as for the blind or deaf and dumb, where an entirely different method of instruction must be pursued—or for particular professions, as Normal Schools for teachers, Agricultural Schools, Military Schools, &c., where, besides practical instruction in the details of each profession, greater importance is attached to those branches of general education, which have a special bearing upon the future labors of the students. Many of these must also mainly depend upon State endowments.

6. There remains still one class of institutions, the aim of which is to direct and encourage adults, whose ordinary education has been completed, to supply the deficiencies of their previous teaching, or to carry on to a later period the mental cultivation, which the necessity of engaging in the active pursuits of life has too early

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interrupted. With this object, I think that in connection with all primary and secondary schools, maintained by the State, there should be evening classes for the benefit of those who, at other hours, are engaged in their various daily avocations. The persons who would avail themselves of these facilities would not, perhaps, be very numerous, especially in the rural districts, and it would be almost useless for any instructor to expect to receive adequate remuneration for his labors from his pupils themselves; but I think it may not unreasonably be imposed as a duty upon the state-paid schoolmaster, that he shall be ready to afford his aid to such adults as may be willing to continue to improve themselves after leaving school. How many instances do we not meet with of men like Stephenson and Watt, who, after the necessary labors of the day were over, have sought instruction amidst difficulties which would have deterred any one from the attempt, who had not a tenacity of purpose far exceeding the average of men; and who, in spite of these difficulties, and without any aid and encouragement from without, have succeeded in their endeavors, and have raised themselves out of the humble class in which they were born. How many instances must each of us know amongst those who have never risen to eminence, but who have fallen within our private observation, of men who have been influenced by the same desire of knowledge, some of whom have partially succeeded, whilst others have either abandoned the attempt in despair, or for want of proper advice and guidance have failed of obtaining a profitable result from their well-meant labors? If the cases of this kind are so numerous even now, when no aid is given and no facilities are afforded, might we not reasonably expect that under more favorable circumstances, even those, who lack the energy to bear down obstacles, would yet willingly avail themselves of such opportunities as might be placed within their reach.

If ever there was a country, in which we might expect a demand for the means of adult education, and in which we should hope to see its useful fruits, it would be one situated like Canada. In most of the older countries of Europe, society has become, as it were,

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stereotyped, and the different classes are separated by almost as distinct boundaries as castes. With rare exceptions, such as the father was, such will be the son, and it will require much persuasion, or an unusual impulse of ambition, to convince either that the education, which served the purpose of the one, will not be sufficient for all the wants of the other. But here, as in other new countries, all such traditional distinctions are thrown down, and all start almost upon equal terms. The mixture of the very various ingredients of our population gives rise to a species of social fermentation which is constantly bringing up to the surface men, who in Great Britain would have remained hopelessly at the bottom, whilst too frequently those, who should have maintained the advantage with which they started, are found to be sinking to an inferior position. No one who has had twenty or thirty years' experience in Canada can have failed to perceive this process going on in both instances.* My own experience has been principally confined to a newly-settled district in Upper Canada; and I could name scores of cases of young men, who, had they remained in Great Britain, would have been hardly above the condition of day laborers, without a thought of ever rising beyond it, who are now prosperous farmers, occupying positions of trust in their municipalities, and seated on the bench of magistrates; and whose sons are looking higher still, and often aspiring to the learned professions. Yet the majority of these men have had little more than the merest rudiments of education; and their sons, except in a few exceptional cases, have had no better opportunities than are afforded by a common school in the back woods, for a few years of their boyhood. If then it be true—and I believe it is so—that every father, in the lower and middle classes in Canada, may reasonably hope that his son, with good conduct, may rise to a higher grade in society than himself, is it not for the interest of all that there should be some means provided by which the son may attain to a higher grade of education also, to aid him in his fight upwards, and to fit him to maintain the position he may reach with credit to himself. Is it not the duty of the State to make provision beyond

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what the common schools afford, for those, many of whom will be amongst our future magistrates, and even our legislators?

In towns, where the tradesmen and mechanics congregate, something is done, and much more might be done, by Mechanics' Institutes, Young Men's Associations, and similar institutions, which may, to a great extent, be supported by voluntary contributions. But in the country parts, unless the State intervene, nothing can be done for those who are past the school age; and even in the towns, evening classes should be open to all who are willing to resort to them, upon the payment of a moderate fee, the State contributing something more in proportion to the number of students.

Amongst such institutions, designed to encourage adult education, we may count societies like our own, standing something in the same relation to those I have been considering, as universities do to schools. We do not profess, indeed, to teach anything, but our papers and discussions cover a large range of subjects, our library is well stocked, and above all, our meetings bring such young men, as are desirous of improving themselves, into connection with those of mature years and longer experience, from whom they may derive valuable hints and advice, and receive hearty encouragement. I think it has been already announced to you that notice has been given of a by-law, which will come up for discussion at our next monthly meeting, which, if it be adopted, will still further increase our field of usefulness in this important particular. It is proposed that we shall establish another class of members—junior members—who shall, under certain restrictions, have all or most of the benefits enjoyed by regular members, for a smaller subscription, but without a vote. I think that the plan might possibly be enlarged, by placing our rooms and one evening in the month at their disposal for papers to be read by them under the presidency of some of the officers of the Society, but from which, out of consideration for the modesty of youth, the public at large would be excluded. I merely throw this out as a hint to the gentleman who has charge of the proposed by-law; but if the suggestion be adopted, care must be taken that these meetings do not degenerate into a mere debating society.

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I have discussed this class of institutions at somewhat greater length than I have given to the others, partly because it is the only branch of the subject with which we, as a society, are directly concerned; and partly because I look upon the want of it as a great deficiency, both in our own educational system and in that of most other countries, and one which is more especially called for by the peculiar features of Canadian society. There is, however, another great difficulty in organizing a comprehensive scheme of national education, to which I have before alluded, and to which I will now return, viz., the second and third classes which I have considered necessary to complete the general plan. They are both intermediate between the primary schools and the universities, and as such are often looked upon as forming one class, but their functions really are very different. If we were imagining a perfect project of national education for an Utopia, I believe we should keep them absolutely distinct, but I do not think that it has been anywhere found practicable systematically to divide them. In older countries, no doubt, some schools have grown up naturally with one special aim, and some with another; but in Canada, where the united classes are so poorly represented, there is no possibility of separating them. In so far as these intermediate schools are designed to complete, as far as it can be carried, the education commenced in the common schools, they have a legitimate claim for State support; but to the extent to which they are preparatory to an extended education in the universities or elsewhere, they may fairly depend altogether, or principally at least, upon the fees of the pupils; and for this latter object, strictly private schools are often resorted to by those who can afford it. But, if we can only expect to have one class of intermediate schools, we must not lose sight of the double duty which they are required to perform, which so materially affects the course of instruction best adapted to fulfil the two-fold object. Each judicious master will be greatly influenced by the different proportions in which the two elements are represented amongst his scholars, but in all cases the course adopted will be a compro-

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mise. Some of his pupils will never be subjected to any further teaching, and will never receive any further guidance in their private studies, than they are to obtain from him; and others he is only preparing and fitting for that higher and more extended cultivation which is to be given them hereafter. In the one case he is completing the edifice, and must fit it, as far as the time allowed him permits it, with everything that is necessary and useful for the purposes for which it is designed, not forgetting a provision for a further extension, if circumstances should render it advisable. In the other, he is principally engaged in preparing a solid and secure foundation upon the general plan of the proposed building, but which may hereafter be finished in a great variety of ways. The architect in two such cases would employ very different materials, and a very different style of workmanship, and the schoolmaster, if he had his choice, would do the same; but he has very little choice, and he must strive to accomplish the almost hopeless task of making his work serve the purpose either of a foundation, or of a superstructure. A large majority of his pupils will probably go no further in the paths of learning than he leads them, and they must not be sacrificed, because they are the majority; the rest he is only putting into training for a journey they are to perform under another guide or alone, and it is of such importance that our best men should have efficient training, that they must not be neglected for the herd. If he tries to get round the difficulty by having two departments in the school, the pupils taking some subjects in common, and others in separate classes, it is a plan which becomes very difficult to be worked in practice, and it almost invariably follows that one or other of the departments gets the preëminence, and the other falls into disrepute and is neglected. I knew one school of reputation in Canada which had a Commercial Department as it was called, the distinguishing characteristic of which was that the boys did not learn Latin. They were classed in fact, not by what they could do, but by what they could not do, the absence of Latin overriding all other differences in their ages, abilities, and acquirements; and they were almost altogether

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entrusted to one master, whose distinguishing characteristic also was that he could not teach Latin. To some extent this may, perhaps, be done of necessity in a mixed school, but it will require very careful management to avoid dangerous results. In a strictly private school; or in a school which mainly depends upon its pupils or a private endowment, even though it may receive, according to our system, some small dole from Government, the master or the trustees may, of course, follow what course of instruction they please; and a school even more largely aided by the State, if specially endowed in connection with a university, will naturally look to this connection as indicating its course of study. But if schools of a higher class are established throughout the country as part and parcel of our national system, which I yet hope to see carried out, it appears clear to me that whatever compromise is attempted,—and some will probably be necessary in all cases,—the pupils who look to these schools for finishing their school education ought certainly not to be sufferers. I would go even further, and maintain that in all schools, not specially designed as preparatory to a university, if the masters study the interest of their pupils, those subjects which can be taught with some reasonable degree of completeness ought to be the main objects, and those which are comparatively valueless, unless pursued beyond the period usually allotted to attendance at school, should be excluded, or at least made only subsidiary. The parents have really very little choice in the matter. The majority have never turned their attention to the subject, or are content that their children should be taught as they were taught themselves, and those who have formed an opinion upon it have rarely more than one accessible school, and their choice for their children is between that and none. The usual law of demand and supply hardly affects the school question, in which there is little competition; and education is a plant of such slow growth, that a generation has passed away before you can judge of it by its fruits. It is with the teachers themselves that must mainly rest the decision, as to the course of study best adapted to accomplish the objects sought for by the complex process which we call education.

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The important question then arises—What are the subjects which can be gone into with some approach to completeness in an ordinary school course? Fortunately there are many upon which there can be no doubt, which are a necessary preparation for what is to follow, and yet complete in themselves, or of undoubted utility to whatever extent they may have been carried. Of this nature are history and geography, the correct use of our own language, and the elementary parts of mathematics. I say elementary mathematics, because this is not exactly the case with the higher branches. Euclid, Algebra, and Trigonometry, beyond which the subject is rarely carried in schools, are of great practical usefulness in after-life, and have always been acknowledged to afford an excellent intellectual discipline of a peculiar kind, whilst they are a necessary foundation for those who intend to pursue the study farther. But, if you go much beyond this, I am not aware of any special advantage which these higher branches possess as a mental training, beyond those which have been gone through before; and a man must have gone pretty deeply into the subject before he can make any useful application of his knowledge. This, however, is a question for our universities, rather than our schools, and the liberty, which in them is always more or less permitted, of individual selection removes the chief difficulties. The practical point in our higher schools is really whether the devotion to Latin and Greek, which takes up the great portion of the pupils' time, allows them to fulfil that important office in our general educational system which should be occupied by what I have called secondary schools, viz., to complete, as far as can be, the education of that large section of our youth, who do not carry on their school training beyond the average age of 13 or 14, and often very much less. I know that my opinions will be thought heretical, that the traditions of our forefathers are against me, and, as a natural consequence, the prejudices of the existing generation; but I will not shrink from expressing a decided opinion that for such institutions Latin and Greek are not the studies most adapted to bring forward the best powers of nine-tenths of our middle and higher classes.

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Let me not be misunderstood. I admit to the fullest extent the merits of these studies, where they can be adequately pursued. I acknowledge the importance of the study of language and its laws, and of grammar, not as a mere collection of arbitrary rules, but as a logical exposition of the modes and processes of thought. No such investigations can be undertaken without a knowledge of more than one language, and the very differences in the degree and kind of development which they had reached, and in the general principle upon which they are constructed, make the languages of Greece and Rome the best adapted of any within our reach, to illustrate what I may call the comparative anatomy of the speech of man. I admit the value of the literature they contain, and the peculiar beauties of the languages themselves, and when we consider that Latin is the immediate mother of half of the modern tongues of Europe, and that both are the foundation of the special languages of almost all sciences, the practical utility of a familiar acquaintance with them can admit of no doubt. Even that minute criticism, in which the accomplished scholar delights, and which it has been sometimes the fashion to ridicule, is a valuable training towards the attainment of precision in expressing, and through that in forming the thoughts. But all this presupposes an accurate knowledge of the languages, or at the least some considerable facility in the use of them. As long as a boy's acquirements do not enable him to do more than, with the help of a dictionary and grammar, to extract from a few short sentences either some sense or nonsense, as he may be in luck or otherwise, he is not in a position to realize any of these advantages; and how many of the lads who leave our Canadian schools have proceeded much beyond this.? During my connection with the University at Toronto, I had experience of several matriculation examinations, and I know something of the amount of Latin and Greek with which our grammar schools furnish those who ought certainly to be advanced beyond the average of the scholars; and the result has been to convince me that the great bulk of them must have spent the best years of their boyhood in very unprofit-

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able studies. It may be said that our preparatory schools are confessedly imperfect, and that under a better system, as in England, a youth of fourteen or fifteen has often attained to a very advanced stage of scholarship. It would be very hard indeed if some of them at least had not; for if I recur to my own personal recollections, at that age I had been taught at school absolutely nothing but Greek and Latin, excepting so much of ancient history and geography as rose naturally out of the books I had been studying. But even in England the average amount of scholarship carried away from school is not spoken of very highly in the recent investigations into the state of our public schools and universities, and the advocates even of Eton are obliged to rest a large portion of their case upon the merits of the training in cricket and boating afforded, and the social advantages of the system pursued there.

Again I may be met with the objection, that if the actual fruit is small, the cultivation of the intellect by which it was attained had a value of its own, and was fitting it to be exercised upon other objects. There is no doubt that any study affords valuable intellectual training, but what advantages have these special subjects over others, where a larger and more available crop might be produced from the same amount of cultivation? The warmest advocates of the merits of the study of the classical languages in this respect will admit, that it is the manner in which they might be taught, rather than that which has been pursued for generations, which has any special claims upon our admiration. We may find fault with our old dictionaries, which either altogether neglected to trace the origin of the words, or gave fanciful derivations which no moderately trained scholar would now tolerate; but I am hardly better satisfied with a modern elementary school vocabulary which exhibits the familiar words under the strange aspect of what are called their crude forms, as *virgon*, which, whatever authority there may be for it in Sanscrit, resembles no known form of the word, either in Latin or any of its modern derivatives. Our old grammars also are as unphilosophical as can well be conceived; but I

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question whether the new ones do not run into an opposite extreme of refining, very proper perhaps for an advanced student, but unsuited to a boy of ten or twelve, whose intellect, though keenly alive to outward impressions, does not lend itself readily to nice distinctions of reasoning. If our former grammars ignored the remains of the old locative and confounded it with other cases, thus giving rise to rules and exceptions which appeared to have no intelligible foundation or origin, a new one is hardly more praiseworthy, which distinguishes (and that, remember, for a mere beginner), five different kinds of what used to be called the genitive case, separated by such subtle lines of demarcation, that Harry's dog and Harry's brother fall under different categories, the one being a possessive and the other only conjunctive. I confess that although I see many marked distinctions between a dog and a brother, I should be rather puzzled to explain to Harry in what the great difference consists in their connection with him, which it is the object of the case to point out. If I were disposed to refine, I think I would make out a stronger case of difference between Harry's dinner, whilst it is still in the dish, and Harry's dinner, after it has been incorporated with Harry himself. In the first instance, it is future and optative, hardly as yet possessive, at least until it is transferred to his plate; in the latter it is perfect, and certainly falls within the meaning of an "inclusive" genitive.

I shall then be asked, would I entirely banish Latin and Greek from our higher schools, and what I would substitute in their place? I would by no means banish them for those who can pursue them till they have attained to some reasonable facility in the use of them. Minute scholarship must always be for the few, but a much larger class may obtain such a moderate mastery over the languages, as to be a source of great pleasure and great usefulness to them in after life. But there is a larger class still, whom it is our duty to educate as highly as circumstances will permit, for whom the amount of Latin and Greek instilled into them has occupied an invaluable portion of their school days, with little if any profit. If we could establish secondary schools as

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a separate class, I would exclude Latin and Greek altogether from the general course as special objects of study, though some acquaintance with their forms and grammatical peculiarities would still be imparted in instruction in grammar, just as now a lecturer will illustrate his teaching of the science of language by references to the Sanscrit the Anglo-Saxon or the Old Norse, of which he himself has probably a most imperfect if any knowledge, whilst his pupils certainly have none, and would have wasted their time if they had attempted to acquire any. But in the master himself I would make a knowledge of the classics essential, for there is not a more fatal mistake, though a very common one, than to imagine that a teacher need only know as much as he is required to teach. Moreover, in such schools there ought to be the means, apart from the prescribed course, of pursuing, if circumstances render it advisable, a study of so much importance.

In so far as we are compelled by circumstances to unite the two objects in one institution, there must, as I said before, be a compromise, and the nature of the compromise will very much depend upon the peculiar situation of the school, and the proportions in which the pupils of the two classes attend it. In all cases there will, no doubt, be a difficulty, but success in any undertaking is only the overcoming of difficulties, and I have too much respect for the abilities of those, whose position entitles them to set an example in educational matters, to doubt that their experience will enable them to devise a method of meeting this one. In some schools it may be possible to have two departments, the pupils taking everything that is common to them together—and this is a great deal—and at other hours pursuing different studies. But for success in this method, there must be no superiority recognized of one department over the other; no suspicion even be permitted to appear, by keeping them apart when they might be united, or by handing them over to inferior masters or otherwise, that those who do not learn Latin and Greek are looked upon as an inferior caste.

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There is another way in which the difficulty may be partially met. If the time which is devoted to schooling is too short to enable a lad to learn anything worth remembering of both Latin and Greek, the same time, if devoted to one of them alone, might lead to something better. If we have to choose between the two, Greek is undoubtedly the finer language, and also the easier language to the beginner, being much less eliptical and less artificial in the construction of the sentences, and the ancient literature it contains is both more extensive and of greater excellence, even exclusive of the sacred writings. But Latin embraces an immense literature of more modern times, and it is more immediately connected with our daily wants, with most of the professions, and with the languages of modern Europe. If only one were practicable, most men would select the Latin. Every man who could do it should study both, but it would be better to have made some moderate proficiency in Latin than to carry away, to be soon forgotten, a few ill understood scraps of both; and to use the words of Doctor Latham, himself a distinguished though somewhat eccentric linguist: "One of the few things which is more useless than a little Latin is a little Greek."

Whatever be the method adopted in each case, some substitute must be found for the two subjects which now engross in most schools the chief portion of a boy's time; and there is no doubt that the physical sciences have the greatest claims to succeed to the vacant throne. But here, too, we must constantly have before us the double aim with which any subject is introduced into a school course, and the essential condition that, however far we attempt to go into it, as far as we do go the knowledge must be exact and solid, and that we do not attempt to embrace a range of subjects which would be incompatible with this fundamental condition. The physical sciences may be so taught as to be quite as useless as a little Greek, or even more so; for false ideas may be carried away which may do much more harm than can possibly arise from any misconception as to the force of a Greek particle. But they may also be taught so as to form a most valuable discipline

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of the mind, even when the amount of positive knowledge acquired is not very extensive. It takes as long a course of study to form a perfect natural philosopher as to train up a thorough classical scholar, but the separate branches of the one study are so much more numerous than those of the other, that a man may acquire a competent knowledge of some departments of science, whilst he is doing little more than learning the rudiments of Latin and Greek. To recur to a metaphor which I have used before—the same amount of labour which would be necessary to complete the Parliament Buildings at Ottawa, would have built a very considerable town, but if the work were arrested in the middle, the one would be perfectly useless even as a lunatic asylum, into which to put its projectors, whilst in the other case there would at least have been some streets of habitable houses for sane people. This completeness, to the extent to which a subject is carried, is fully as important if we have regard only to the mental training as if we look to the practical use, for precision of thought and knowledge is the essence of both.

But it is constantly objected by those who, without denying the importance of the physical sciences, deprecate the introduction of their study into schools, that we have a class of teachers already trained to make Greek and Latin grammar the engine by which the intellectual faculties of a boy are to be brought out and strengthened, whilst the sciences have been studied more for their own sakes, and not with a view of turning them to the best account as a means of education. They would admit the studies if they were sure that we could find competent masters, forgetting that the art of training by means of the sciences, in so far as it may differ from the same skill in working with a different material, can only be learned by practice, an opportunity for which is denied. The old stage coachman was a well trained individual, and performed his peculiar duties with credit, but if it was found advisable to exchange the stage coach for the railroad car, it would have been a poor argument to suppress railroads until we had as thoroughly practised a class of conductors as the old system could boast.

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The real question is, whether the sciences can be made as good a means of instruction as the languages of Greece and Rome, and if that is admitted,—and I for one have no doubt upon the subject,—the best method of applying them may safely be left to the educated men to whom the duty is entrusted.

That the physical and natural sciences are not always taught in schools upon a sound principle, I am prepared to admit; but are Latin and Greek, in spite of the practice of several centuries, invariably studied on a philosophical method? If our teachers of science are not all Faradays and Tyndalls, neither, assuredly, are our grammar school masters all Max Müllers or Donaldsons. That the sciences can be taught so as not only to be a source of delight to the learner, but an admirable means of enlarging his views, and training him to precision and accuracy of thought, the lectures of the distinguished philosophers whom I have named are a sufficient proof; and we can hardly expect that the best methods will be followed, or the best men direct their energies to the subject, until the studies come to form a recognized branch of education in the better class of schools. I rather think that in most of our schools at present, which do admit the sciences into their studies, the pupils are crammed with an array of facts, the bearing of which is very imperfectly understood, and with a string of technical terms connected with still less precise ideas. It is hardly worth while to abandon even the Eton grammar for such knowledge. The thing which it is important to learn, both as a matter of training and even for practical use, is not the facts themselves, so much as the reasons for which we know them to be facts, and the methods by which that knowledge was arrived at. Now, many of these sciences require for their complete mastery the highest branches of mathematical knowledge, and for others extensive museums and costly apparatus are necessary; and as these cannot be available in a school, it is thought sufficient to lay the results merely before the pupil. But though these inaccessible aids were essential to the discoverer of the facts, they are hardly ever—I may say never—necessary towards making the method he

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pursued perfectly intelligible, and it is to this phase of the subject that attention should be almost exclusively devoted.

Thus, if the subject be astronomy, the pupil in our ordinary schools has probably learned a tolerably correct abstract of what may be called the statistics of the solar system. He can enumerate the planets in their order, with their relative distances, number of attendant satellites, &c., and he can talk glibly of centripetal and centrifugal force. Now this is a very barren knowledge, even if he had not entirely misapprehended, which it is ten to one he would do, the real meaning of centrifugal and centripetal force. But it is quite possible to make a boy, with the most elementary knowledge of mathematics, or even with no mathematics at all, strictly so called, to comprehend how we came to know these things to be facts. And even if you can go further into the niceties of the science, and explain the planetary perturbations, although the calculations themselves require the most refined analysis, which neither the teacher nor the pupil can comprehend, there is a thread of common sense running through the whole, which would enable a boy of quick apprehension to understand how the disturbances can be traced, and how they must necessarily produce effects of the kind which are observed. If the subject be chemistry, no elaborate apparatus is necessary to exhibit numerous interesting experiments, and to explain the leading principles of the science, and to shew how, with better appliances, we might produce results which cannot be repeated in the school-room. If the subject be botany, you want no extensive museum. The unrivalled collection of nature is always at hand. But it is of no use to learn from books the definition of a petal or a stamen, or the principles of the classification—the student must see and handle the separate parts of the flowers, and must classify them for himself.

In a word, in the elementary study of all sciences, the main object should be not to store the student's memory with facts which others have discovered, and with principles which others have established, but to lead him to discover the facts, and to establish

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the principles for himself, and to impress upon him the methods by which he may find out more. It is with this view that the history of science becomes such an important part of its study You thus trace out the gradual increase of knowledge, how the discoverers rose by degrees from isolated facts to general laws; you see their failures as well as their successes, their mistakes as well as the truths they established; and the student can realize how he, with time and opportunity, might have gone through the same course, and what were the qualities essential to success.

As thus studied—and they might be thus studied—I cannot imagine a more wholesome training than the sciences afford, and not only an intellectual but a moral training. The pupil learns not only how to observe, how to compare things both in their resemblances and in their differences, to classify them according to the various features they exhibit, to draw general conclusions from the examination of particular facts, to exercise his judgment when several possible solutions of the difficulty present themselves, and to form a proportionate judgment based upon the weight to be attached to the different views, and to reserve his opinion if the arguments do not appear decisive. He not only does this, but he learns also to restrain his imagination, to distrust his prejudices, and to resist the temptation of twisting his facts to suit his expectations or his hopes. He is emphatically a searcher after truth, and he learns from the example of other conscientious explorers how every prejudice, every theory, every aspiration of ambition and hope of profit can be sacrificed at the shrine of the great principle which is the object of his search.

There is another view of the subject, which strongly commends the physical and natural sciences as objects of study in youth. If there is any one quality which is a more universal characteristic of children than another, it is their inquisitiveness. From infancy upwards, hardly an object can be presented to their minds but their curiosity is excited, and they wish to know the meaning of it, and the reason and object of it. Every parent must have frequently been puzzled how to answer such queries, and has

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probably replied somewhat to the effect that the answer would be beyond the comprehension of his interrogators, whereas if he had spoken with perfect truth he should more properly have said, that he did not know himself, or at least not sufficiently to give a clear and intelligible answer. He had probably asked some such question himself in his childhood, and had been similarly put off; and the age of inquisitiveness had passed by before he had an opportunity of otherwise satisfying himself. Now it is the function of the sciences to discover the true answers to nine-tenths of the questions relating to the material world which children do ask, and shall we say that we will refuse them answers on subjects, with respect to which it is the natural bent of their minds to be inquisitive, and concentrate all their energies upon the elucidation of the principles of grammar? I have had many difficult questions put to me, but it never occurred to me to be asked what was the peculiar difference in the force of the genitive in the two expressions Harry's brother and Harry's dog, and if it had happened, I am afraid I should not have given a satisfactory answer. Everybody can appreciate the different zest with which a study is engaged in, which falls in with his natural turn of mind, as compared with one which is forced upon him *invitâ Minervâ*, and for this, if for no other reason, the sciences form a most appropriate study for the young.

One thing, however, I hold to be certain, that however their introduction may be resisted, they will undoubtedly, in the end, take the place to which they are entitled. They have already forced themselves into the universities, and their introduction into the schools must follow. Education is not an abstract idea, and the best system cannot be decided upon the first principles of human nature, and be declared to be immutable and equally adapted to all ages and all countries. It is the process of forming a man to fill the place, which he is designed to occupy in the society which surrounds him, and as the characteristics of that society change, in accordance with the law of constant movement which pervades everything human, his duties, his wants and his

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aspirations will change also. The education, which was the best for one age, will be unsuited to the requirements of another. In ancient Greece, the speculative tendency was largely developed, and practical excellence was chiefly in the direction of art. In neither direction have they ever been surpaseed. Phidias is still unrivalled, and the logic, the pure geometry and the metaphysics, which they elaborated for themselves, have descended to us with hardly an addition in two thousand years. Rome received its civilization from Greece, and followed it *haud passibus æquis* in its favorite subjects of intellectual culture. But Rome also created for itself another science, arising out of its own peculiar constitution of society—the science of jurisprudence—which formed an essential principal part of the education of every Roman, and which has descended to us as one of the most perfect efforts of human intellect. During the middle ages, all learning was embraced in the Latin language, which was the means of intercommunication between all nations, and when a knowledge of Greek began to spread, besides its importance to theologians, its literature was found to contain so much of the prevailing studies which was imperfectly given by its Latin imitators, that there is no wonder that it also became acknowledged as an essential subject of education. But another age succeeded, in which the physical and the natural sciences rose up, and are daily rising in new developments around us, and the languages in which they are presented to us is no longer Latin and Greek, but English, French and German. Shall we say that, whilst the world has advanced, and our grown men are engaged in the pursuits of the nineteenth century, our youth are to be confined to the studies of the fifteenth and sixteenth? What was a necessity with them is no necessity with us, but a new range of subjects has arisen, and the training of our youth must follow in the direction to which the spirit of the age points. We need not indeed abandon studies, the excellence of which has been tested by the experience of past ages, but neither must we ignore those which are commended to us by the practice of our own. The Romans did not the less

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value the philosophy of Greece, because they added to it a science of which Greece knew little; neither need we neglect the old studies because we find it essential to make room for the new. But the old must no longer be exclusive. They must be content to divide the empire with their younger brethren, and the advocates of the time-honored classical languages would do well to consider, that if they do not willingly admit of an associate, they may before long find themselves displaced by an usurper.

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PAPER II.—LIST OF COLEOPTERA TAKEN AT QUEBEC, AND OTHER PARTS OF LOWER CANADA.

BY WILLIAM COUPER,

Curator, Quebec Branch Ent. Soc. of Canada; Cor. Mem. Ent. Soc., Philad.; Nat. Hist. Soc., Montreal; Assist. Sec., Lit. & Hist. Soc., Quebec.

[For former Lists, &c., see Transactions of Literary and Historical Society, Quebec, New Series, Part II, 1863–4.]

(*Presented to the Society, January* 18, 1865.)

CICINDELA *Linn.*

repanda *Dej.* Collected by Mr. A. L. Russell, Quebec.

BLETHISA *Bon.*

julii *Lec.* Rare. Found under stones, &c., in marshy places near Quebec. Dr. LeConte lately described it from a specimen taken in Nova Scotia by Julius Ulke, Esq., of Washington, D. C.

NEBRIA *Fabr.*

moesta *Lec.* Collected at Gaspé by Mr. Denis Gale. It also occurs at Lake Superior, Saskatchewan river and Russian America. *Lec.* Proceed. Acad. Nat. Sci., Philad., 1860, p. 318.

LEBIA *Latr.*

tricolor *Say.* Collected at Portneuf *en haut*, by the Rev. Mr. Provancher. Mr. Krieghoff had a specimen taken at Lake St. Laurent.

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PTEROSTICHUS *Bon.*

[illegible] *Dej.*; abjectus *Lec.* Beauport. Uncommon. Placed by Mr. LeConte in § OMASEUS *Ziegl.*

AMARA *Bon.*

[illegible] Canadian Naturalist, Vol. II, No. 2, New Series.

[illegible] Quebec.

[illegible] *Hald.* Quebec.

[illegible] Quebec.

[illegible] splendida *Hald.* Occurs at Quebec and [illegible] Mackenzie river.

[illegible] Quebec. The above are now classed by Mr. Le [illegible] under § [illegible] *Zimm.*

[illegible]ENIUS *Bon.*

[illegible] Banks of Montmorency river. [illegible]

[illegible] *Lec.*

[illegible]

[illegible]

[illegible]

[illegible]

[illegible]

[illegible] The Quebec [illegible] with the Russian American [illegible]

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lucidum *Lec.* Banks of the Montmorency river.
bimaculatum (*Kirby*) Portneuf *en bas.*
rupestre (*Fabr.*)
transversale *Dej.* § PERYPHUS *Meg.*
patruele *Dej.*
incrematum *Lec.* Quebec and Russian America. § NOTAPHUS *Meg.*
simplex *Lec.*
dilatatum *Lec.* § EUDROMUS *Kirby.*
versicolor *Lec.* § NOTAPHUS *Meg.*

AGABUS *Leach.*

tristis *Aubé.* Quebec, rare. Russian America.
punctulatus *Aubé.* Quebec, uncommon.

COPTOTOMUS *Say.*

interrogatus *Aubé.*

HYDROBIUS *Leach.*

tumidus *Lec.* Quebec. Rare.

GYRINUS *Linn.*

fraternus *Couper,* Can. Nat., Vol. II, No. 2, New Series.

HELOPHORUS *Fabr.*

lacustris *Lec.* Quebec. Very common.

CATOPS *Fabr.*

opacus *Say.* Common.

BOLETOBIUS *Leach.*

bimaculatus *Couper,* Can. Nat., Vol. II, No. 2, New Series.

STAPHYLINUS *Linn.*

*cinnamopterus *Grav.* I described this insect on page 80 of the last series of the Lit. and Hist. Soc. Trans. It is the last on the page.
*violaceus *Grav.* Also described as No. 2 on the above page.

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No. 1 is *S. badipes*, a new species lately described by Dr. LeConte.

NECROPHORUS *Fabr.*

lunatus *Lec.* Quebec. Rare.

orbicollis *Say.* Hallii *Kirby.* Quebec. Rare. "This species occurs in the N. W. Territory." *Say*, Jour. Acad. Nat. Sci., Philad. 5, p. 178.

confossor *Lec.* Quebec. Very rare. This species also occurs at Lake Superior and Oregon. N. mortuorum *Fabr.*, given in my former list, is found in Russian America.

OXYPORUS *Fabr.*

stygious *Say.* Quebec. Uncommon.

vittatus *Grav.* var. cinctus *Grav.* Quebec. Rare.

SCAPHIDIUM *Oliv.*

quadripustulatum *Say.* Quebec; very rare.

piceum *Mels.* Quebec; very rare.

MYCETOCHARES *Latr.*

bicolor *Couper*, Can. Nat., Vol. II, No. 2, New Series.

CISTELA *Fabr.*

quadristriata *Couper.* Can. Nat., Vol. II, New Series.

IPS *Fabr.*

quadrisignatus *Say.* Quebec. Uncommon.

TRIPLAX *Payk.*

flavicollis *Lac.*

EPURAEA *Er.*

convexiuscula *Mann.* Quebec and Russian America.

PSEPHENUS *Hald.*

LeContei *Hald.* Quebec. Rare.

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APHODIUS *Ill.*

inquinatus *Fabr.* Quebec. Introduced from Europe.
vittatus *Say.*

DICHÆLONYCHA *Kirby.*

linearis *Burm.* Collected by Mr. A. L. Russell, Quebec.

DICERCA *Esch.*

lacustris *Lec.* Quebec, very rare.
tuberculata *Fitch.* Quebec. Uncommon.

ANCYLOCHIRA *Esch.*

rusticorum *Lec.* Trans. Am. Philosophical Soc., Nov. 1859, p. 208; Anoplis rusticorum *Kirby*, Fauna Bor. Am. 151. Quebec, very rare. Collected by Mr. A. L. Russell. This species is also found in Oregon and California

PŒCILONOTA *Esch.*

cyanipes *Say.* Quebec. Rare.

ANTHRAXIA *Esch.*

subænea *Lec.* Quebec. Rare.

CHRYSOBOTHRIS *Esch.*

trinervia *Kirby.* Quebec. Uncommon.
femorata *Fabr.* Quebec. Race δ. Uncommon.

AGRILUS *Sol.*

gravis *Lec.* Taken at the Hermitage. Rare.
fulgens *ib.* " " "

DRASTERIUS *Esch.*

dorsalis *Say.* Quebec.

CAMPYLUS *Fischer.*

denticornis *Kirby.*

ATHOUS *Esch.*

affinis *Couper*, Can. Nat. Vol. II, No. 2, New Series.
rufifrons *Lec.*

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PITYOBIUS *Lec.*

Billingsii? *Bland.* Proceed. Ent. Soc. Philad. Vol. III, p. 69. Taken by the Rev. Mr. Hamel at Cap Tourmente. The differences pointed out by Mr. Bland are not sufficient to separate it from P. anguinus *Lec.* This can be verified when a number are placed side by side. I have examined several fine specimens in the cabinet of Dr. LeConte and Mr. Ulke, and compared a specimen taken at Cap Tourmente, but cannot see good grounds for separating them. Dr. LeConte will probably carry me out in this statement.

CORYMBITES *Latr.*

appressifrons *Randall.* Quebec. Rare.
triundulatus *ib.* "

TELEPHORUS *Geoff.*

armiger *Couper*, Can. Nat. Vol. II, No. 2, New Series.
scitulus *Say.*

SILIS? *Charpentier.*

lutcicollis *Germ.*

PODABRUS *Fischer.*

simplex *Couper*, Canadian Nat., Vol. II, No. 2, New Series.
punctulatus *Lec.*

DICTYOPTERA *Latr.*

perfaceta *Say.*

HYLOBIUS *Germ.*

pinicola *Couper*, Transactions Lit. and Hist. Soc., Quebec. New Series, part II, p. 85.

I remarked when the above was published that another of the same size was found in Western Canada, but with marked difference of elytral characters. I had not the western insect to compare with my Quebec specimen. However, I sent the latter to Dr.

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LeConte, who informs me that "*it is a good species* allied to H. arcticus of the other continent." He says "he had it previously from Lake Superior, and it appears as H. heros (MS.) in my report on Coleoptera of Lake Superior, in Agassiz's Work."

This insect is therefore H. heros of Dr. LeConte's manuscript, and H. pinicola as cited above. However, I now leave it in the hands of the talented author of the Catalogue of N. A. Coleoptera.

CENTRINUS *Sch.*

scutellumalbum *Say.*

POLYDROSUS *Sch.*

elegans *Couper*, Can. Nat., Vol. II, New Series.

GRYPIDIUS.

vittatus *Couper*, Can Nat. Vol. II, No. 2, New Series.

OTIORHYNCHUS *Germ.*

sulcatus (*Fabr.*) *Germ.* Introduced from Europe.

ASEMUM *Serv.*

moestum *Hald.*

SPONDYLUS *Fabr.*

upiformis *Mann.* Quebec. Rare.

CALLIDIUM *Fabr.*

sanguinicollis *Horn.* Quebec. Uncommon.

TETROPIUM *Kirby.*

cinnamopterum *Kirby.* Quebec. Rare.

CLYTUS *Fabr.*

erythrocephalus *Oliv.* Quebec. Very rare.

PSENOCERUS *Lec.*

supernotatus (*Say.*) *Lec.*

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SAPERDA *Febr.*

moesta *Lec.* Quebec. Rare.

GAUROTES *Lec.*

cyanipennis *Say.* Collected by Mr. A. L. Russell.

ACMÆOPS *Lec.*

proteus *Kirby.* Quebec.

TOXOTUS *Serv.*

vittiger *Randall.* Montmorency. June.

LEPTURA *Linn.*

mutabillis *Newman.*
nigrella *Say.*
biforis *Newman.*

DONACIA *Fabr.*

piscatrix *Lac.* Lake St. Joachim. Common.

SYNETA *Esch.*

tripla *Say.*

PHYLLOBROTICA *Dej.*

discoidea *Fabr.* decorata *Say.* Quebec. August, on the Mad-dog Scull-cap (Scuttelaria latiflora.)

HALTICA *Fabr.*

alternata *Ill.* 5-vittata *Say.* On Willows near the Hermitage.

CRYPTOCEPHALUS *Geoffr.*

formosus *Mels.* Hermitage, June; Gomin woods, July.

CHRYSOMELA (LINA) *Fabr.*

interrupta *Fabr.* var. 5.
scalaris *Lec.* var.

MYSIA *Muls.*

subvittata *Muls.* St. Louis road. Rare.

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HYPERASPIS *Redt.*

maculifera (*Muls*) *Lec.* Hermitage. Rare.

MORDELLISTENA *Lec*

fuscipennis *Mels.*

ENDOMYCHUS *Payk.*

biguttatus *Say.*

NACERDES *Steven.*

melanura *Linn.*

ASCLERA *Schm.*

puncticollis *Say.*

SERROPALPUS *Hellenius.*

substriatus *Hald.*

PHLOEOTRYA ? *Lec.*

sericea *Hald.* Seminary Garden, Quebec. Rare.

DITYLUS *Fisch.*

coeruleus *Randall.* Collected by Mr. D. Gale.

SCHIZOTUS *Newm.*

cervicollis *Newman.*

STENOTRACHELUS *Lec.*

arctatus *Say.* St. Foy Road from 20th to 24th September. I found four specimens of this rare insect between the above dates. Its rarity may be attributed to the lateness of its occurrence. Few entomological excursions are made at this season, which may account for its being heretofore overlooked. Dr, LeConte, in a letter says: "I am glad to learn that you have found two more specimens of S. arctatus; it is a very interesting insect, and was known to me previous to receiving your specimen, only by fragments which I cut out of a dead tree at Lake Superior. The subsequent reception

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of a specimen from Russian America enabled me to establish the synonymy which is as follows :—

Stenotrachelus arctatus *Lec.* Class. Col. North America, 252.
Helops arctatus *Say*, Long's Expedition. St. Peters, 2, 283.
Steno. obscurus *Mann.* Bull. Mosc. 1852, 317."

DACNE *Latr.*

fasciatus *Fabr.* Quebec, under bark, rare. *D. heros Say*, occurs in Upper Canada.

MICRORHOPALA.

interrupta *Couper.* Can. Nat., Vol. II., No. 2, New Series.

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Paper III.—COPPER MINING IN CANADA EAST.

By HERBERT WILLIAMS, M.E.,
MANAGER OF THE HARVEY HILL COPPER MINES.

(*Read before the Society, 15th March,* 1865.)

The discovery of copper ores in the Eastern Townships may reasonably be within the memory of most persons present, as dating within the last fifteen or twenty years, whilst actual operations for their development only commenced within the last seven years.

The first discovery appears to have been made on lot No. 4, in the second range of the Township of Inverness; and although some very fine samples were exhibited in the City of Quebec, it was some time before any notice was taken of the circumstance. I believe it was not until some samples were shewn to one of your most enterprising citizens, Dr. James Douglas, whose characteristic shrewdness induced him to enquire into the matter, that a move was made, the result of which was the formation of the Megantic Mining Company.

The second discovery was that now known as "The Harvey Hill Mine," situated on lot 17, in the fifteenth range of the Township of Leeds, which was also secured by the same gentleman and his associates, who organized a company under the name of "The Quebec and St. Francis Mining Company."

This second discovery seems to have created some excitement at the time, as several other companies appear to have been organized for working copper mines in the Eastern Townships about this period, and beyond the purchasing of large tracts of land and the procuring of charters of incorporation, little appears to have been done by any of the Companies, excepting the Quebec and St.

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Francis Mining Company, who made such explorations on Harvey Hill as enabled them, in the spring of 1858, to bring it under the notice of some English capitalists, who organized themselves under the Imperial Statutes, with "limited liability," as "The "English and Canadian Mining Company." Under the auspices of this company, systematic mining operations were commenced, and have been uninterruptedly continued up to the present time, with the results to be hereafter detailed.

In the autumn of the same year (1858), operations were commenced by Mr. Sleeper, on that most extraordinary deposit, known as the Acton Copper Mine. Although the discovery of copper ore of very rich quality had been made some few years previously, so incredulous appeared the public mind on the subject, that the property was purchased by Mr. Davis, of Montreal, for a very insignificant sum and a royalty; but that gentleman had so little faith in his purchase, that he at once let it to Mr. Sleeper on "tribute," at two-thirds of all the ore that he could obtain from it for a period of three years.

The enormous results obtained by Mr. Sleeper, almost immediately on commencing his operations, induced more extensive researches, leading to the discovery of copper (as reported in May, 1859, by our eminent Provincial Geologist) in sixty-seven different localities in various parts of the Eastern Townships, since which period I may fearlessly state that copper ores have been found in thousands of places.

My own occupations in connection with the development of copper mines in the Eastern Townships commenced in the year 1858. The observations and examinations that I have made since then extend over a large area of the country, the minute details of which cannot be comprised within the limits of a short review on the copper mines of the Eastern Townships, such as I purpose submitting to you on the present occasion; but to those who may desire to form a better acquaintance with the geology of the Eastern Townships, for the purpose of rendering its mineral resources commercially available, I would strongly recommend a

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careful study of the report of our eminent and deservedly popular Provincial Geologist, Sir W. E. Logan, published in 1863, by Messrs. Dawson of Montreal.

The amount of valuable information to be obtained from a careful and patient perusal of that most valuable compendium of the labors of the geological staff of this Province, cannot, I fear, be fully appreciated in the present stage of mining operations; but its importance will appear in the future development of the immense mineral resources of this country, by enabling the miner to trace, with some degree of certainty, the limits within which he may reasonably expect to find copper ores in the rocks of the Quebec group, which is regarded as the equivalent of the upper copper-bearing strata of Lake Superior.

The structure of this important mineral region, in which numerous deposits of copper ore occur, is described in that work as follows :*—" The strata of this region, which include both the " Quebec group and some dark-colored slates supposed to underlie " it, are, from the effect of undulation, arranged in long parallel " synclinal and anticlinal forms, with many overturn dips. The " latter circumstance renders it difficult to determine which of " these folds are synclinal and which anticlinal, inasmuch as the " outcrops, in both cases, present a similar arrangement. The " weight of evidence, however, at present goes to show that the " strata dip towards the centre of the areas about to be described, " and they will therefore be designated as synclinals. These in " the part of the region which has been most examined (extend- " ing from the boundary line of Vermont to the Chaudière River), " are three in number," the first of which is briefly defined as " The synclinal extending from the Township of Farnham, " near Missisquoi Bay, to the Seigniory of Lauzon, on the St. " Lawrence. This, where it is traversed by the St. Francis, is " nearly or quite separated into two parts by the appearance of " the underlying slates. The south-western portion appears to be " divided by an undulation into at least two subordinate troughs,

* Page 709.

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"thus giving in Roxton and Ely an additional breadth to the "exposure of these rocks. The copper deposits of Upton, Acton, "Wickham, Roxton, and Durham, occur in this synclinal, while "in its north-eastern extension are those of Wendover, Somerset, "Nelson, and St. Flavien."

In the long extent of this synclinal, although copper ore has been found in a great number of localities, the Acton mine necessarily claims precedence of all others, as having yielded by far the greatest quantity of copper. The celebrity which this mine attained during the first few years of its working, will, I doubt not, be fresh in the recollection of most persons present. Several valuable papers have been published on the subject, both in the records of the Geological Survey and in the *Canadian Naturalist*. One, in particular, published in the latter, in December, 1862, by Mr. Thomas Macfarlane, is well worthy the perusal of every student and miner in the province, as affording a very large amount of detail with regard to the actual working of the mine from 1st September, 1861, to 30th September, 1862. The total amount of ore taken out during that period appears to have been 2,336 tons, averaging about twelve per cent. of fine copper, or at the rate of about 179 tons per month.

By the Directors' Report to the shareholders, up to the end of September, 1863, the total amount of ore taken out for the year appears to be 3,695 tons, nearly 308 tons per month, the same averaging 12-46th per cent. Although this exhibits a fair increase in the produce of the mine, the balance-sheet for the same period does not exhibit an equivalent increase in financial results to the stockholders; neither did the mine present, at the end of that year, the same promising appearance that it did the year previous, as no sinking appears to have been done with a view to the discovery of more ore, and the creating of further reserves.

The ores at Acton and other places along the course of this synclinal are composed of the vitreous, variegated and yellow sulphurets, with occasional traces of green carbonate of copper, and are characterised as occurring associated, in most places, with

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bands of greyish-white and reddish-grey compact sub-crystalline yellowish weathering dolomitic limestone. Explorations have been made upon outcrops of copper so associated, at Upton, Wickham, Durham, Somerset, Nelson, and St. Flavien, besides a great number of intermediate localities between these places, some of which have resulted in the production of a few tons of good quality ore; but, being prosecuted by American capitalists, the high rate of gold as compared to the value of the present American currency has necessitated the suspension of operations in most of them for some months past, and has even curtailed operations in the great Acton Mine.

The second synclinal is described as "extending from St. "Armand to the Seigniory of St. Mary, on the Chaudière. In it "are the copper deposits of Sutton, Shefford, Stukely, Melbourne, "Cleveland, Shipton, Chester, Halifax, Leeds, Inverness, and St. "Mary. In its southern extremity, this synclinal is divided into "two by Sutton Mountain, and while one part occupies Sutton "Valley, the other extends southward into Potton."

The Harvey Hill Mines, in the development of which I have been chiefly engaged, lie within the limits of this synclinal. Active operations were commenced here in the spring of 1858, by developing some quartz courses found cropping out at surface, and carrying chiefly the vitreous and variegated sulphurets of copper. These courses were found to be lenticular in form, cutting the strata of the country in their strike and dip; and although the ores discovered in them were of the very richest quality, the actual result, commercially, was by no means as satisfactory as could be desired, arising mainly from their very limited extent, both longitudinally and vertically, and the great cost necessary for their extraction and the subsequent preparation of the ores contained in them for transport to market. These courses, though bearing some resemblance to lodes occurring in dislocations of stratification, did not present the usual indications to the eye of the miner by which similar discoveries are made in Europe, viz., by their gossan outcrop; they nevertheless presented highly favor-

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able indications of the existence of copper ore in depth, and such as induced more extensive explorations with a view to ascertain whether they were not connected with regular lodes beneath the surface. These explorations, though not meeting with any lodes in depth, made other discoveries that may eventually prove of much greater importance to the country than old European theorists on the formation of copper will probably admit for some time to come, viz., the existence of copper ores imbedded in the slates of the country, in quantities sufficient to render their extraction highly remunerative, with careful management and economy in laying out the works.* These slates present in section an undulating appearance, and the copper is disseminated through them in lenticular masses, varying from one-sixth of an inch to two and three inches in thickness, and in length exhibiting lines varying from three inches to eighteen inches, and at times over two feet.

These masses may, for the most part, be considered as overlapping one another, with variable distances between them; whilst the ore is disseminated throughout the whole thickness of the bed, which varies between five and six feet.

The existence of this bed has been proved, at intermediate distances, for a length of over two hundred fathoms; the breadth has also been proved for an average of between seventy and eighty fathoms. Therefore the area, as far as it has been proved, may be assumed to contain about sixteen thousand superficial fathoms of ground.

By careful trials, the average yield of the richest portion of the bed is computed at a little over twelve and a half tons of three and a half per cent. ore to the superficial fathom of ground, or about 190,000 tons in that portion of the bed which has been proved, the extraction of which, supposing it to be worked at the rate of one hundred tons per day, will occupy between six and seven years. It must not, however, be supposed that the foregoing limits

* Three such deposits have been met with at Harvey Hill, the upper one of which is now being wrought.

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comprise the entire extent of the copper-bearing slates; for works are now in progress, proving their existence over a very much greater area. In speaking of this bed, I may observe that two other mines have been started on its run in other properties, one of which has already a shaft sunk over thirty fathoms in depth; and from the general nature of the ground now in the bottom of the shaft, there is every prospect of meeting the ore-bearing slates equally rich as they are at Harvey Hill.

In estimating the probable value of the ores that may be regarded as in sight at Harvey Hill, we may take the average of the Swansea sales, showing the unit of copper to be worth $4.50. Hence, the ton of rough ore, at the mouth of the mine, may be regarded as representing $15.75, and the 190,000 tons contained within the area above described will therefore be worth $2,992,500.

The long land carriage, however, of these ores to market, renders their concentration on the premises necessary, with a view to effect a saving in that item of expenditure. This is done by a system of washing, by which the average percentage of the ore is raised to about eighteen or twenty per cent.

This operation, unfortunately, entails a loss of some of the copper in the mass, which may be estimated at about one-fifth, leaving for transport to the smelting furnaces a money value of ore copper of about $2,394,000.

In stoping the slates, some lenticular quartz courses, similar to those discovered at surface, are met with; but in no instance, up to the present time, have they been found to pass through the ore-bearing strata, but they appear to take their rise from them.

One of these, which seems to have taken its rise beneath the bed, yielded nearly two hundred tons of ore, averaging over thirty per cent. of pure copper, and has not yet been exhausted. This, however, seems to have interfered with the general yield of the bed in its immediate vicinity, as the average yield of copper in the slates is considerably diminished for some distance. This fact goes far to strengthen the theory suggested by Sir W. E. Logan,

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"that the quartz courses derive their copper from the interstratified beds."

Some quartz courses have recently been discovered above the bed, apparently carrying a fair amount of ore, but no explorations have as yet been made upon them; so their extent or productiveness has not been ascertained. I may, however, here remark, that the productiveness of the bed itself does not appear to have been affected in the same manner in the vicinity of those quartz courses taking their rise above the bed, as it is by those taking their rise from beneath the bed, for I have not as yet been able to perceive any diminution in the quantity of copper in the slates in the former case.

With reference to the bed, therefore, as I believe will be the case in several other localities along the course of this synclinal, when the country is more thoroughly explored and its resources developed, it will not be the question of the quantity of ore, there being no doubt now about the weight of ore that can be taken out monthly at Harvey Hill, within the limits already proved, but everything will depend upon the judicious laying out of the explorations, and the amount of working capital employed.

The difficulty at Harvey Hill, as I shall endeavor to show, is not now the one we, at the commencement of our operations, had to contend with, or the usual one met with in mining—a want of ore. There is at present, and for some time to come, a certain guarantee, without the usual mining chances to contend with. The difficulties to overcome at the present time are quite of another order. First, we have that of working up, on the spot, a very large mass of ore, rendered difficult by a want of water for its manipulation and ultimate separation from a considerable portion of gangue or the matrix with which it is associated; and, secondly, a want of roads, and consequently a want of an easy transport to a foreign market. We have paid as high as $10 per ton for the carriage of our ores to Quebec; we now pay about $7 per ton. When that cost shall be reduced by the introduction of a tram road to the Grand Trunk Railway, to the construction of which I

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look forward with some amount of certainty within the next few years, larger profits will be made on the working of the mine by the saving alone between the present price of carriage and the reduced price, even supposing it should be greater than that of other countries.

In treating the subject of our copper mines and their ultimate importance in the great future of the province, a comparison with some of the European mines may not be uninteresting. "The Devon Great Consols Copper Mine" of England, produces monthly about 1,800 to 2,000 tons of dressed ore, averaging about six per cent., and to produce which some 25,000 to 30,000 tons of lode will be broken, containing perhaps, on an average, a half or three-quarters per cent. of copper. Now, 30,000 tons of bed stuff broken at the Harvey Hill Mines would produce about 4,200 tons of twenty per cent. ore, worth at present prices about $387,000, whilst the same amount of lode, in the other case, does not produce more than about 2,000 tons of six per cent. ore, worth at the same rate about $54,000; so that in point of value as regards quality, our Canadian mines present no mean contrast with the greatest mine at the present day wrought in Great Britain. And at no distant day, I trust to see the other beds already discovered more extensively developed and opened out, and the monthly yield of rough ore equal even to that of the Devon Great Consols.

The works at Harvey Hill, from their commencement in the spring of 1858 to the autumn of 1864, were almost entirely of an exploratory character, notwithstanding which the following weights of ore have been sent to market:—

	Tons.	Cwt.	Qrs.	lbs.	
In 1858.....	9	15	0	2	Averaging about 30 per cent.
" 1859.....	43	7	0	21	
" 1860.....	104	5	3	0	
" 1861.....	70	4	1	6	
" 1862.....	94	17	2	21	
" 1863.....	113	20	3	14	do 26 do
And " 1864.....	235	12	3	3	do 20 do
Making a total of	671	20	2	11	

The mining ton being 21 cwt., or 2,352 lbs.

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It will therefore be perceived by the foregoing figures that there has been a very perceptible falling off in the average quality of the ores sent to market in the two years 1863 and 1864, as compared with the five previous years; this arises from the fact that during the two past years but small quantities of ore were obtained from the quartz courses, the chief portion having been obtained from exploratory drivages on the interstratified bed.

In following the course of this synclinal in a south-westerly direction, the copper-bearing slates present themselves in several places. There is no difficulty in tracing them, notwithstanding the absence of gossan. There are other characteristics observable by which their existence is identified, one of which is the association of chloritoide with the slates.

The metamorphic action of the copper on the slate is characterised by some peculiar alterations in that rock whenever the copper is in contact with it. A more minute study of the phenomena as presented to view would be in the highest degree interesting to geological science, and most valuable to the practical miner.

These phenomena are observable over extensive areas in the Township of Leeds, as also in the Townships of Ireland, Inverness, Halifax, Wolfestown, Chester and Ham.

Copper ore is also found in these several townships associated with a yellowish-brown weathering dolomitic limestone, and the discovery of its existence in quantities sufficient to render its extraction highly remunerative may be reasonably expected after careful exploration.

Up to the present time, although explorations in the townships above enumerated have been on a very limited scale, there are several exposures of copper well worthy the attention of capitalists.

The Township of Chester seems to have drawn the particular attention of explorers. Some of the discoveries in that township may be regarded as presenting the most promising indications; particularly the Viger Mine, situated on lot No. 8, in the sixth range.

On the adjoining lot, No. 9, in the same range, some very pro-

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mising indications are also exposed by the partial explorations which have been made on the property.

On lot No. 11, in the tenth range, some very fine samples of variegated copper were broken on the side of the Nicolet River, where it passes through that property, and on lot No. 11, in the eleventh range, a band of copper-bearing slates, several feet in thickness, was exposed during the past summer.

Along the continuance of the second synclinal, from Chester to St. Armand, there have been numerous explorations made, and copper discovered in nearly the whole of the intervening townships. I have not yet had an opportunity of examining them, therefore I cannot speak more particularly as to their promise of productiveness.

The third synclinal is described as "extending from the "Owl's Head Mountain on Lake Memphremagog, to Ham, and "includes the Stoke Mountains. An extension of this is traced "north-eastward to Vaudreuil and St. Joseph, on the Chaudière "and beyond it, into Buckland. Between the south-western "portion of this synclinal and the second one, is a large area occu-"pied by newer rocks, of the same age as those which limit the "belt to the south-east. They include the slates and limestones "which occupy the northern part of Lake Memphremagog; and, "extending through parts of Oxford and Brompton, cover a con-"siderable area in the contiguous parts of the Townships of "Windsor, Wotton, Ham, and Stoke. These unconformable "rocks overlie and conceal a large portion of the strata of the "third synclinal; but along the eastern limit of this are exposed "the copper deposits of Ascot, Ham, and Garthby."

The Ascot Mine was discovered about the year 1859, and was leased by the late Thomas McCaw, Esq., of Montreal. The copper-bearing bed in this mine differs very considerably from that at Harvey Hill, both in its composition, extent, and regularity, the ore being the yellow sulphuret (copper pyrites), associated with a little iron pyrites; the matrix is composed of an impure limestone associated with chloritic schist; the average thickness of the bed varying between five and six feet.

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The limited means of the proprietor in this case for carrying on works, the very nature of which necessarily required a large amount of capital to open them up, with a view to the more profitable extraction of the ore, only enabled him to carry on such works as yielded ore in quantities sufficient to pay for the labor as he went on. In this he was tolerably successful, some of the ore yielding in the rough state as broken in the mine, and without any dressing, as much as eight per cent. of copper; whilst the poorer portion, from the nature of its matrix, could at small cost be dressed to an average of twelve or fourteen per cent., with but small loss of its copper contents.

The ore from this mine was discovered, at the smelting works at Boston, to contain within itself all the elements necessary for its reduction and liquefaction in the furnace, without requiring the aid of any foreign flux or admixture of other ores for the purpose of smelting it. In addition to which it was ascertained that this ore answered admirably as a flux for such ores as those from the Acton and Harvey Hill Mines, which are deficient in sulphur, and those from the Clark and other mines, containing silicious matters, requiring lime as a flux in their metallurgical treatment.

The ore from this mine therefore may be regarded as of some importance, should smelting works be established on a large scale in the province, as may be inferred from the fact that this mine was, in the fall of 1863, purchased by an American Company who erected furnaces at Lennoxville for the smelting of the ores from this and other mines in the province; and operations were carried on by them for some time successfully and profitably; but the lamentable difficulties of our neighbors for the past few years, and the great difference between the value of their currency and ours, compelled, a few months ago (like many other enterprises in this province carried on with American capital), the temporary suspension, at least for the present, of their smelting as well as mining operations.

About a mile to the north-east of the Ascot Mine is the Clark Mine, also possessed by an American Company. Here a bed of

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copper-bearing slates of considerable thickness was discovered, and operations have been vigorously carried on for the last year, and large quantities of ore have been taken out and sent to market. Of the approximate quantity of ore extracted or its copper contents, I am not aware. There are several other localities in the neighborhood of Lennoxville where copper ores in promising quantities have been met with.

In the Township of Ham, on lot No. 28, in the fourth range, near to the line of Wolfestown, some considerable work has been done within the last two or three years, on a mass of dolomitic limestone averaging over one hundred feet thick. On the upper strata of this limestone, to a depth of twenty or thirty feet, the variegated and yellow sulphurets of copper have been found in nodules, and lenticular masses of no mean promise. The band of copper-bearing rock has been traced for some distance. When I visited this mine about two years ago, a large pile of very promising ore had then been taken out. Some machinery has since been erected for crushing and dressing the ore, and this mine may, I think, be reasonably regarded as one likely to become permanent.

On lot No. 26, in the second range of the Township of South Ham, several veins have been discovered subordinate to the stratification, varying in thickness from two to ten feet, and presenting at surface promising indications, by exposures of copper pyrites and green carbonate of copper in costeens made on the lot.

In the Township of Garthby, on lot No. 22, on the first range north, there appears a large mass of iron and copper pyrites subordinate to the stratification, which consists of calcareous serpentine.

The entire thickness in which the sulphurets are mingled with the rock is over twenty feet. Samples of copper have been broken from the mass, yielding by essay as much as twenty-two per cent., whilst samples of sulphuret of iron have also been broken, which on being submitted to assay, were found almost entirely free from copper.

An opening was made on this a couple of years ago, and sunk to a depth of about ten feet, and the sulphurets were found to

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continue for that depth with some regularity. A shaft was then commenced a little distance to the south-east of the outcrop of the mass, the object being to prove its nature at a depth of about ten fathoms from surface. This reached a depth of between seven and eight fathoms, when the quantity of water met with was such as required the aid of pumping machinery to enable the work to be proceeded with, and the same was in consequence suspended.

From the foregoing remarks, the existence of copper ore over a large area of the Eastern Townships, along the divisions laid down in the able Geological Report of Sir W. E. Logan, as described in the three synclinals, may be regarded as fully established.

That copper mines in the Eastern Townships present features of future promise, and inducements for the investment of capital for their more perfect and permanent development, will, I have the fullest belief, become patent within the next few years to capitalists seeking legitimate enterprise.

I must not, however, forget to lay great stress on the economical expenditure of labor, as well as capital, in all mining operations; as much injury might be done to the mining industry of the country by injudicious management of labor or disadvantageous expenditure of capital.

In conclusion, it must not be supposed that the mere discovery of copper ore constitutes a mine, as was the case at Acton, which may be truly regarded as one of the most extraordinary occurrences ever met with in the history of mining. On the contrary, it will be found in Canada, as in other countries, that it most frequently requires a large expenditure of capital, and the patient and persevering prosecution of works of an exploratory nature, for several years, before the long hoped-for return finds its way into the treasury of a company.

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PAPER IV.—THE ANCIENT SCANDINAVIANS,—THEIR MARITIME EXPEDITIONS, THEIR DISCOVERIES, AND THEIR RELIGION.

BY PROFESSOR PAUL C. SINDING, OF COPENHAGEN, DENMARK,
COR. MEM. OF QUEBEC LIT. AND HIST. SOC.

(*Read before the Society, 5th April,* 1865.)

History has scarcely recorded the annals of a people who have occasioned greater, more sudden, or more numerous revolutions in Europe than the Scandinavians, the Danes, Norwegians and Swedes, or whose antiquities, at the same time, are so little known. At what period of time these three ancient kingdoms began to be inhabited, historians have never been able te ascertain with any full degree of certainty. But it is very probable that the first Danes, Norwegians and Swedes, who belonged principally to the Gothic tribe, were, like the Teutonic nations, a colony of Scythians who dwelt round about the Black Sea, and that from them the first colonies were sent into Denmark. From this people, I mean that branch of them which was called the Cimmerian Scythians, they, in all probability, inherited the name of *Cimbri*, which name they bore long before they got that of Danes. They inhabited, a long time before the nativity of Christ, the country that had from them the name of the *Cimbrica Chersonesus* or *Cimbric Peninsula*, which now is called Jutland, and is a part of the Danish monarchy. But all that passed in Denmark before Christ would be entire darkness to us, if the famous expedition of the Cimbri and Teutons, 150 years before Christ, into Italy, had not drawn upon them the attention of a people who enjoyed the advantage of having historians. More than 300,000 men, consisting both of Cimbri and Teutones, left their country, and roamed wildly about in Germany, killing and plundering wherever they went. The Gauls also were overwhelmed with this torrent, whose course was then

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for quite a long time, marked by the most horrible desolation; and when at length it was reported in Rome that they were disposed to pass into Italy, the consternation there became general. Upon entering Italy they sent an embassy to the Romans to offer them their services, upon condition that they would give them land to cultivate. The Senate, unwilling to enter into any kind of accommodation with such ruthless enemies, returned a direct refusal to their request. The Cimbri and Teutones now resolved to take by force what they could not gain by entreaty, attacked the Roman provinces in Southern Germany, and defeated the Romans five times in succession with immense slaughter. The Teutones (the Germans) now separated themselves from the Cimbri, the Teutones going into Spain, the Cimbri into France. In this melancholy conjuncture the Romans appointed the great and brave Marius commander-in-chief, and he saved Rome. He marched into France, and pitched his camp opposite the Teutones, who had now returned from Spain. In the camp of the Teutones were heard continued howlings like those of savage beasts, so hideous, that the Romans, and even their general himself, could not but testify to their horror. At length the battle commenced with great impetuosity, when finally the victory declared itself entirely in favour of the Romans. This victory, Marius, the Roman general, gained at Aquæ Sextiæ in Southern France, in the year 102 B.C., and the Roman historians relate that the inhabitants of Marseilles made inclosures for their gardens and vineyards with the bones of the slaughtered Teutones, and that the soil thereabout was so much fattened that its increase of produce was prodigious. But the Cimbri (the Danes) who had separated themselves from the Teutones, still threatened Rome. Marius was charged to raise a new army with the utmost speed, and to go and engage them. The Cimbri sent a message a second time to demand an allotment of land, which demand again met with an unconditional refusal. Then the Cimbri prepared immediately for battle, and their General approached the Roman camp to agree with Marius on a day and place of action. Marius announced that although it was

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not the custom of the Romans to consult their enemies on this subject, he would, however, oblige them, and appointed the next day but one, and the plain of Verceil, in Northern Italy, for the hostile meeting. The Cimbri were, after a most desperate engagement, routed, and 120,000 of this fierce and valiant nation were mowed down. This battle was fought in the year 101 before Christ, and put an end to their invasion of Rome. I do not pretend to decide whether the first inhabitants of the three Scandinavian countries were, all of them, without any mixture, Cimbri and Teutones; for although it appears probable with regard to Denmark, it cannot be denied that the *Finns* and *Laplanders* anciently possessed a much more considerable part of Scandinavia than they do at present, and were formerly spread over the southern parts of Norway and Sweden, whence in process of time they have been driven out by new colonies of Scythians, and banished amongst the northern rocks, in like manner as the ancient inhabitants of Britain have been dispossessed by the Saxons of the greatest and most pleasant part of their island, and forced to conceal themselves amongst the mountains of Wales, where to this day they retain, as we know, their peculiar language. But to return to Denmark. Up to this very year, 101 B. C., when the Cimbri were, as we have heard, defeated by Marius, and even until 250 years after Christ, the Danes were called Cimbri. In Christ's time Frode Fredegod (Pacific) is said to have been king of Denmark. The rulers of that time, however, were not called kings, but Drosts, that is to say, generals; and *Rig*, ruler of Skane, a province in the southern part of Sweden, adopted first the title of king. A new generation begins with *Dan Mykillati* (the Splendid), whom all historians consider the founder of the country called Denmark, 250 A.D. Some have from him derived the name Denmark, but it is more probable that it has originated from the word *Dan*, denoting *low* or *flat*, and from *Mark*, denoting *overgrown with wood*,—the name Denmark thus signifying a flat land overgrown with wood. About 150 years before the time of Dan Mykillati lived *Nor*, a prince from Finnland. He went through

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Lapland into Norway, conquering most of this country. All that he subdued he called Norway, and this country has always since borne this name.

But how formidable soever, as we have seen, the ancient Scandinavians were by land to most of the inhabitants of Europe, it must yet be allowed that their maritime expeditions occasioned still more destructive ravages. We cannot read the history of the eighth, ninth and tenth centuries without observing with surprise the ocean covered with their vessels. During the space of two hundred years, they almost incessantly ravaged England, often invaded Scotland and Ireland, and made incursions on the coasts of Livonia and Pomerania. Charlemagne is known to have shed tears on hearing that these barbarians had, on some occasion, defied his name, and he foresaw what his people would suffer from their martial spirit under his successors. And his fear was well grounded. They soon spread like a devouring flame over Lower Saxony, Holland, Flanders, and the banks of the Rhine, and wherever they went, they went as lords and rulers. They pillaged and burnt Paris, Bordeaux, Angoulême, and many other cities. In short, they ruined France, levied immense tribute on its monarchs, and burnt the palace of Charlemagne at Aix-la-Chapelle. They often carried their arms into Spain, and in the year 844, a band of these sea-rovers attacked Sevilla, which they soon made themselves masters of. The better to account for that strange facility with which the Scandinavians so long plundered, and so frequently conquered the Anglo-Saxons and the French, we must remark that their cruelty, which gave no quarter, had impressed these nations with such terror, that they were half vanquished at their very appearance. The profession of piracy was so far from appearing disgraceful to them, that it was in their eyes the certain way to honors and fortune. Hence it is that in the ancient chronicles, more than one hero boasts of being the most renowned pirate in the North, and that often the sons of the great lords and kings made voyages in their youth, in order to make themselves illustrious. This is what we see happen very frequently after

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Harold Hairfair had once made himself master of all Norway, which before his time was divided into several petty states. This Harold made a vow neither to comb nor cut his hair until he had subdued the whole of Norway, and as it took him several years to do this, it grew so long and thick that he was called Harold the Hermit. Having finally accomplished the conquest of all Norway, he took a bath, combed and trimmed his hair. His appearance was so much changed for the better by these cleansing operations, that he was given the surname: Hairfair. The vessels of these Scandinavian pirates were always well provided with offensive weapons, such as stones, slings and arrows, which they considered their dearest property, and therefore we must not be surprised that they should take it into their heads almost to worship their instruments of war, without which their passion for conquest could not have been gratified. The respect they had for their weapons made them almost swear by instruments so valuable, as being the most sacred things they knew. It is therefore with peculiar propriety that Shakspeare makes Hamlet, his Prince of Denmark, call upon his companions to swear upon his sword,—

> "Come hither, gentlemen,
> And lay your hands upon my sword:
> Never to speak of this that you have heard
> Swear by my sword."

The soldiers engaged themselves by an oath of this kind, not to flee though their enemies should be superior in number, and they often formed amongst themselves a kind of society or confraternity in which the several members engaged, at the expense of their own lives, to avenge the death of their associates, provided it were honorable and violent. Accordingly, we never find any amongst those people guilty of cowardice, the mere suspicion of that vice being always attended with universal contempt. A man, who had lost his buckler or who had received a wound behind, could never more appear in public. In the history of England we therefore see a famous Norwegian captain, who had sent his son to attack a province in Scotland, ask with great coolness those who brought the intelligence of his son's death, whether his son

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had received his wounds behind or before. The messengers telling him that his son was wounded before, the father cried out: "Then I have every reason to rejoice, for any other death would have been disgraceful both to my son and myself."

But the mind of the Scandinavians was not only bent on piracy and robbery; they directed also their attention to discoveries in the North and in the far West. The Faroe Isles had been discovered at the latter end of the ninth century, by some Scandinavian pirates, and soon after this, Iceland was colonized by the Norwegians, where a flourishing republic was established, in which the old Danish or old northern language was preserved unchanged for centuries, and Iceland became the cradle of a northern historical literature of immense value. The Icelandic chronicles also relate that the Northmen discovered a great country to the west of Ireland, and it seems very clear that they made their way to Greenland in the end of the tenth century, and they are thus the first discoverers of America. The settlement made in Greenland seems to have been very prosperous. They had bishops and priests from Europe, and paid the Pope an annual tribute. But the art of navigation must have been at a very low pitch, for the voyage from Greenland to Iceland and Norway and back again, consumed five years, and upon one occasion, the government of Norway did not hear of the death of the Bishop of Greenland until six years after it had occurred. But the same age which saw the bearded sea-kings and vikings of the North discovering Iceland and Greenland, beheld them also in New England, in the States of Massachusetts and Rhode Island, and with extraordinary energy. The very first of the old documents to which I briefly will request the attention of my hearers, is the Saga of *Bjarne Herjulfson*. On a voyage from Iceland to Greenland, in the year 986, this man was driven far out to sea, towards the South-west, and for the first time beheld the coasts of the American land, afterwards visited by his countrymen. In order to examine these countries more minutely, Leif the Fortunate purchased Bjarn's vessel, and undertook a voyage thither in the year 1000. With thirty-five hardy

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men he landed on the shores described by Bjarne, detailed the character of these lands more exactly, and named them according to their appearance. Helluland (Newfoundland) was so called from its flat stones, the word Hellu signifying a flat stone; Markland (Nova Scotia), from its woods, the word Markland signifying woodland; and Vineland (New England), from its vines. A German, named Tyrker, who accompagnied Leif on this voyage, was the man who found the wild vines which he recognized from having seen them in his own land, and he gave the country the name of Vineland from this circumstance. But amongst the most interesting of the old documents at this period, is that of *Thorfinn*. He was an Icelandic merchant, whose genealogy is carried back in the old northern annals to Danish, Norwegian, Scottish and Irish ancestors, some of them even of royal blood. In the year 1006 this chief, on a merchant voyage, visited Geenland, when he married a woman by the name of Gudrid. Accompanied by her and a crew of 160 men, he repaired to Vineland (New England), where he remained for three years, and had many communications with the aborigines. Here his wife, Gudrid, bore him a son, called Snorre, who was the very first child of European parents born in America, and this child became the founder of an illustrious family in Iceland, which gave that island several of its first bishops. The notices given by this illustrious navigator, Thorfinn, respecting the climate, the soil and the productions of New England, are very characteristic, and correspond with the language of less questionable narrators five hundred years later. Upon the whole, it is the total result of the nautical, geographical and astronomical evidences in the original documents, which places the location of the countries discovered beyond all doubt. The number of days' sail between the several newly-found lands, the striking description of the coasts, especially the white sand-banks of Nova Scotia and the long branches of a peculiar appearance on Cape Cod, are not to be mistaken, and cannot but open our eyes with interest. In addition hereto we have the astronomical remark, that the shortest day in Vineland (New England) was

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nine hours long, which fixes the latitude of 41° 24′ 10″, or just that of the promontories, which limit the entrances to Mount Hope Bay, in the district around which the old Northmen had their head establishment. Thus the claim that the Northmen were the very first discoverers of America seems to be placed on good foundation, and it is embodied in the learned work of Dr. C. C. Rafn of Copenhagen, "Antiquitates Americanæ." However, this does not, I may be allowed to remark, lessen the great merits of the immortal Columbus, nor have I referred to it for this purpose; but we ought, nevertheless, not to forget that Columbus visited the Danish island, Iceland, in the year 1477, had access to the archives there, and must doubtless have heard of the former discoveries of the northern roving sea-kings.

But before concluding, I must briefly touch the religion professed in Scandinavia before the introduction of Christianity, or what we call the Scandinavian mythology, a subject replete with interest to all intelligent people. A celebrated tradition, confirmed by the poems of all the northern nations, by their chronicles or sagas, by their institutions and customs, some of which subsist to this very day, informs us that an extraordinary person named *Odin* formerly reigned in the North, that he made great changes in the government, manners and religion of these countries, that he enjoyed there great authority, and had even divine honors paid him. His true name was Siggo, but he assumed that of Odin, who was the Supreme God amongst the Gothic and Teutonic nations. This Odin, who invaded Scandinavia seventy years before Christ, is, as known almost to everybody, the founder of a new religion, which we call the Scandinavian mythology, having undoubtedly some affinity to the old Scythian religion, from the borders of which country he probably came,—I mean from the region between the Black and the Caspian Sea. A space of seven or eight years intervened between the time of Odin and the conversion of Denmark, Norway and Sweden to Christianity. The motive of the worship introduced by Odin had a great resemblance to the Christian ideas, containing much of the spirit of

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obedience for which St. Paul praises the heathen that are without the law, but do by nature the things contained in the law, showing the works of the law written in their hearts. It was namely the fear of a divinity irritated by the sins of men, but who, at the same time, was merciful, and capable of being appeased by prayer and repentance. To serve this divinity by sacrifice, to do no wrong to others, and to be brave and intrepid in themselves, were the moral consequences. Lastly, the belief in a future state completed the whole building. Cruel tortures were there reserved for such as despised those fundamental precepts of morality, and pleasures without number awaited every valiant man. Odin passed among the inhabitants for the *God of War*. No object, in their opinion, could be more worthy his attention. Hence he is called in the Icelandic chronicles, "The terrible and severe god, the father of slaughter." The warriors who went to battle made a vow to send him a certain number of souls; these souls were Odin's right; he received them in Hlidskjalf, the name of his palace, where he treated them with an inspiring beverage, more inspiring, say the old Sagas, than ever after can be quaffed. The assistance of Odin was implored in every war, and it was believed that he often descended himself to intermix in the conflict in order to inspire the combatants with courage. But this terrible divinity, who took such pleasure in shedding the blood of men, was, at the same time, according to the old chronicles, their father. He had created the heavens, the air, and before the heavens and the earth came into existence, he lived already with the giants, that is to say, he was eternal. These ideas, however, were not peculiar to Scandinavia. The Germans, for instance, attributed likewise to the Supreme Being a superintendency over war. There remain, up to this very day, some traces of the worship paid to Odin in the name given by the people of the North and of England to the fourth day of the week, which was consecrated to him. It is called by a name signifying Odin's day. In Old Norse, *Odinsdag;* in Swedish and Danish, *Onsdag;* in Anglo-Saxon, *Wodenesday;* in Dutch, *Woensdag;* and in English, *Wednesday*.

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Oden was, as we have heard, the principal god amongst the Scandinavians, but they had also goddesses, amongst whom *Frigga*, the wife of Odin, was the principal. Another celebrated goddess was *Freia*. She was the goddess of love, and plays a prominent part in the northern mythology. She was addressed in order to obtain happy marriages and easy childbirths. The celebrated Iceland poem, called the Edda, styles her the most favorable of the goddesses, but she went to war as well as Odin, and divided with him the souls of the slain. It appears to have been the general idea that she was the same as Venus of the Romans, since the sixth day of the week, which was consecrated to her under the name of Freya's day, was rendered into Latin, "*Dies Veneris*," or Venus's day; in Danish, *Fredag;* in German, *Freitag;* in Anglo-Saxon, *Frigedag*; in English afterwards, *Friday*. The second principal god of the ancient Scandinavians was *Thor*, whom the Gothic and Teutonic nations valued about as highly as Odin who was considered his father, and the Scandinavians called him the bravest of the sons of Odin. He always carried a mallet or hammer, which he grasps with gauntlets of iron, and he was further possessed of a girdle which had the power of renewing his strength as often as it was needful. He was considered the defender of the gods, and the god of thunder and lightning. To him the fifth day of the week was consecrated—In Danish, *Torsdag;* in Old Norse, *Thorsdag;* in German, *Donnerstag*; in Dutch, *Dondertag*, and in English, *Thursday*. These divinities here mentioned were the principal objects of worship among the old Scandinavians; but they did not all agree amongst themselves about the preference which was due to each of them. Thus the Danes and the Anglo-Saxons seem to have paid the highest honor to Odin, the Norwegians and Icelanders to Thor, and the Swedes had chosen for their protecting divinity Frey, the husband of Freia, who presided over the seasons of the year, and bestowed fertility and health.

Baldur was another son of Odin, wise, eloquent, and endowed, say the old Sagas, with so great majesty that his very glances were

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shining. *Tyr*, to be distinguished from Thor, was also a warrior divinity, from whom is derived the name given to the third day of the week—in Danish and Norwegian, *Tirsdag;* in German, *Dienstag;* in Anglo-Saxon, *Tyrsdag;* and English, *Tuesday*. *Bragi*, another son of Odin, presided over eloquence and poetry. His wife's name was Idunna. She had the care of certain apples, which the gods tasted when finding themselves growing old, and which had the power of instantly restoring them to youth. *Heimdal* was the doorkeeper of the gods. The gods had made a bridge between heaven and earth; this bridge was the rainbow. Heimdal was employed to watch this bridge for fear the giants should make use of it to get into heaven and make war upon the gods. But this Heimdal was, besides his office, quite a remarkable person; it was a difficult matter to surprise him, because the gods had given him the faculty of sleeping more lightly than a bird, and a ear so fine that he could hear the very grass grow, and the wool on the backs of the sheep. I suppress here the other gods who made up the number of twelve, but I must bestow a few words upon *Loki*, whom the ancient Scandinavians seem to have regarded as the serpent is regarded in the Bible. Genesis says, "The serpent was more subtle than any beast of the field, which the Lord God had made." The serpent is the evil, seducing principle. So is Loki in the Scandinavian mythology; but the difference is, that the Bible does not rank the serpent like a god, which the Scandinavian mythology does in respect to Loki, who is ranked amongst the gods. He is like a god, beautiful in his figure, but his mind is evil, and he surpasses all mortal beings in perfidy and craftiness. He continually fights with the gods, who, however, at last conquer this evil principle, and shut him up in a prison, where he remains captive till the end of the ages, when he shall be slain by Heimdal, the doorkeeper of the gods. Then a new earth shall spring forth from the bosom of the waves, the fields shall bring forth without culture, calamities shall be unknown, a palace is there erected more shining than the sun, all covered with gold. This is the place that the just will inhabit, and enjoy delights for evermore.

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I have remarked that there were twelve gods, and the Scandinavian mythology reckons also twelve goddesses, including Frigga, the spouse of Odin, and the chief of them all. The court of the gods was ordinarily kept under a great ashtree called *Yyrdrasill*. This ash is the greatest of trees; its branches cover the surface of the earth, its top reaches heaven. From under one of the roots of this tree runs a fountain, wherein wisdom is concealed, and from a neighbouring spring three virgins, young maidens, are continually drawing precious water, with which they water the ashtree. These three virgins always keep under the ashtree, and they are considered they who dispense the days and ages of men, like the three Parcœ or Destinies in the Greek mythology, who presided over human life and span it out.

But when we now advert to observing the prevailing mode of worshipping these divinities, then we find almost the same idea of these deities amongst the ancient Scandinavians as the Bible, 2d Chron. chap. 6, expresses, where Solomon says when dedicating the temple, "Behold, heaven and the heaven of heavens cannot contain thee, O God, how much less this house, which I have built," for it was at first thought offensive to the gods to pretend to inclose them within the circuit of walls. The ancient Scandinavians, therefore, worshipped first their divinities in the open air, and neither knew nor approved they of the use of temples. We find thus up to this very day here and there in Denmark, Norway and Sweden, in the middle of a plain, or upon some little hill, altars around which they assembled to offer sacrifices. But by degrees, as the Scandinavians formed new connections with the other European nations, whether by the numerous maritime expeditions they undertook, or by the foreign colonies established amonst them, their religion tolerated at length grottoes, artificial caves, which we especially find in Norway, cut with incredible pains in the hardest rocks, until they at length commenced to use temples and idols, and at length adopted them without any reserve. Their most famous temple was that at Upsal in Sweden.

The ancient Scandinavians had *three* religious festivals in the

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year. The *first* was celebrated at the winter-solstice, and they called the night on which it was observed, the mother-night, as that which produced all the rest, and this epoch was rendered the more remarkable, as they dated from thence the beginning of the year, which, amongst the Northern nations, was computed from one winter-solstice to another, as the month was from one new moon to the next. This festival was named *Yule*, the name anciently also in England given to Christmas, and was celebrated in honour of the sun, in order to obtain a propitious year. When Christianity had been introduced, this festival was, as we know, celebrated as the birthday of our Saviour, and in England called Christmas, but the three Scandinavian nations retained the name Yule, which name is still used. Sacrifices, feastings, nocturnal assemblies, and all the demonstrations of a most dissolute joy were then authorized by the general custom, and they answered in their character to the Roman saturnalia. The *second* festival was instituted in honour of the *Earth*, which was considered a goddess, to request of her fertility, and this festival was fixed at the first quarter of the second moon of the year. This was the chief festival of the Swedes, during which they held their Supreme Court. The *third* festival, which seems to have been the most conspicuous, was instituted in honour of Odin, and was celebrated at the beginning of spring, in order to obtain from him, being the God of Battles, happy success in their military and maritime expeditions.

In the infancy of mankind all offerings consisted, as we know, of the fruit of the ground, and of the firstlings of the flock. We read in Genesis, chap. 4th, "In process of time it came to pass that Cain brought of the ground an offering unto the Lord, and Abel he also brought of the firstlings of his flock and of the fat thereof." Such were also the offerings which the ancient Scandinavians brought unto their gods and goddesses, such namely as husbandmen and shepherds could present. They loaded the altars with the first fruits of their crops and with the choicest animals. Nevertheless, when they would ask for any favor which they ardently wished for, or would deprecate some public calamity

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which they feared might happen, the blood of animals was not deemed sufficient, but they began to shed that of men, and this barbarous custom was not entirely abolished till towards the end of the ninth century, when they received the glorious light of the Gospel. Then they chose among the captives in time of war and among the slaves in time of peace, nine persons to be sacrificed, the bodies of which unfortunate victims were afterwards suspended in a sacred grove near the temple, of which grove every tree and every leaf was considered the most sacred thing in the world. And in a great national calamity, if the people believed that they had some pretext to impute the cause to their king, they even sacrificed him as the highest prize with which they could buy the divine favor. In this manner the first king of Vermeland, a province of Sweden, was burnt in honor of Odin in order to put an end to a great famine. The kings in their turn did not spare the blood of their subjects, and many of them shed even that of their children. Thus a king of Sweden devoted to Odin the blood of his nine sons, to prevail upon Odin to prolong his life. The ceremony always concluded with feastings, by which they drank immoderately, and the kings and chiefs drank first healths in honor of the gods; every one drank afterwards, making some vow or prayer to the god whom they named, and hence came that custom amongst the first Christians in Scandinavia and Northern Germany of drinking to the health of our Saviour, the apostles and the saints, a custom which the Church was obliged, although reluctantly, for a long time to tolerate.

It was a general belief amongst the ancient Scandinavians that they easily might learn the will, inclinations and desires of their gods and their goddesses through the instrumentality of *oracles* and *divinations* like the people of olden Greece, and it was generally believed that the three virgins before mentioned, who watered the celebrated ash tree and dispensed the days and ages of men, delivered out these oracles in the respective temples. Saxo Grammaticus, the famous Danish historian of the twelfth century, tells us that it was customary amongst the Danes to consult the oracles

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of those three virgins concerning the destiny of children recently born. But oracles were not the only efforts made by the ancient Scandinavians to penetrate into futurity. They had *diviners*, both male and female, honored with the name of prophets and prophetesses, and they did the same as Moses says, Deuter., chap. 18th, of some pagan nations, "They hearkened unto observers of times and unto diviners." Some of them were said to have familiar spirits, whom they consulted under the form of idols; others dragged the ghosts of the departed from their tombs. Poetry was often used for the like absurd purpose, and the Skalds or bards boasted of power to disturb the repose of the dead, and to drag them out of their graves by certain songs which they knew how to compose. The belief in this power ascribed to these skalds or bards was so engrafted in the community, that even after the introduction of Christianity the priests were considered to have inherited this power from the skalds, wherewith they, amongst the superstitious people, made a most lucrative business. Nay, even a long time after the introduction of the Lutheran Reformation, the ministers of the Gospel were believed to understand the *black art*, as this power was called, and although this imposture was, as an abomination unto the Lord, severely forbidden by the government, the ministers often clandestinely made use thereof, thereby to increase their income.

But the same superstition and ignorance which made the ancient Northern nations believe in the power of the priests to disturb the repose of the dead, and to drag them out of their graves by certain formulas and songs, persuaded them also that some letters or *runic characters*, consisting of sixteen marks, and beginning with the letter "F," the origin of which is ascribed to Odin, included in them certain mysterious and magical properties. Impostors easily made a credulous people believe that these letters, combined after a certain system, were able to work miracles and to predict future events. There were letters or runes to procure victory, to relieve women in the perils of child-birth, to soften the severity of a cruel master, and to secure fidelity to the

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connubial bed. Some engraved runes on their nails to make their sweet-hearts faithful to them, some on the hilt of their swords to be successful in war, some on the helm of their ships to avoid tempest and hurricane. The same superstition induced them to lend an attentive ear to the *singing of birds*, which some sorcerers or sorceresses boasted of being able to interpret. The ancient history of Scandinavia is full of these superstitious practices, which continued a long time after the introduction of Christianity, nay, even after the introduction of the Lutheran Reformation. Upon the whole, superstition was so engrafted in the people that even men of extensive learning, whose reason was brought to the greatest perfection, and who engaged themselves in the deepest speculations, were more or less superstitious. Tycho Brahe, the celebrated Danish astronomer of the sixteenth and seventeenth centuries, was very superstitious, considering certain days in the year pregnant with misfortune, wherefore in Denmark, up to this very day, the laboring class call such days on which they happen to meet with some unfortunate accident, Tycho Brahe's days. He did even carry his superstition so far, that when going out in the morning his first meeting was with an old woman, he believed that something unfortunate would happen to him before the conclusion of the day.

But this superstition, however deeply rooted and engrafted, did not blind all the ancient Scandinavians without exception. History testifies that there were after all amongst them men wise enough to discover the folly of the received opinions, and courageous enough to ridicule them without reserve. In the history of the Norwegian king, Olaf Trygveson, a warrior, did not fear to say that he placed more confidence in his own strength and in his arms, than in Odin and Thor. "I have travalled in many places," he says, "I have met with giants and monstrous men; they could never overcome me, thus to this present hour my own strength and courage are the sole objects of my belief." Rolf Krake, King of Denmark in the sixth century after Christ, said one day when one of his companions proposed to offer a sacrifice to Odin, that

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he feared nothing of that blustering and swaggering spirit, and that he would never reverence him nor make sacrifices to him. Indeed we see appear at intervals men endued with a real strength of mind, who did not only trample under foot all the objects of credulity and idle superstition, but who even raised their minds to the invisible Master, the Father of the sun and of all nature. In an Icelandic chronicle, a man by the name of Giest says to his nephew, who was about to embark for the discovery of America, "I beseech and conjure Him who made the sun and the stars, to give success to thy great undertaking." But still more remarkable are the words of Harold Hairfair, the first king of all Norway in the ninth century, when Christianity had *not yet* found its way to that country, "I swear in the most sacred manner that I will never offer sacrifices to any of the gods adored by my people, but to Him only who has formed the world, and what I behold in it." To describe minutely like expresssions from many wise men would only occasion tiresome repetitions, and I shall, therefore, confine myself to remarking that at the end of the ninth century Christianity was introduced into the three Scandinavian kingdoms, Denmark, Norway and Sweden, the vestiges of the pagan worship were destroyed, its idols overthrown, its altars demolished, and its temples closed, and Christianity has since prevailed in Scandinavia, and formed the great bond of the social happiness and the great source of the intellectual eminence which this remote quarter of the globe now so richly enjoys.

It is scarcely necessary, I think, that I should take notice, before concluding, that I here only have been delineating a nation in its infancy, and that the greatest part of the other Europeans were neither less savage nor less uncivilized during the same period; and the great prerogative of Scandinavia, and what ought to recommend its inhabitants beyond almost every people on earth, is that they afforded the great resource to the liberty of Europe. Montesquieu, the admirable author of the Spirit of Laws, calls Scandinavia the fabric of those instruments that broke the fetters manufactured in the South, and I do not hesitate to conclude by saying

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that the stalwart men who ventured upon unknown, cold and stormy seas, and at length landed on the New England shores, and who since have controlled the world's history in many things and at many times, and whose achievements in war and in letters are worthy the most heroic age of Rome and the most finished period of Greece, should be saluted with respect by all succeeding generations.

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PAPER V.—THE SLESWICK-HOLSTEIN QUESTION.

BY PROFESSOR PAUL C. SINDING, OF COPENHAGEN, DENMARK,
COR. MEM. OF QUEBEC LIT. AND HIST. SOC.

(*Read before the Society, 19th April, 1865.*)

The Sleswick-Holstein question—the term "Sleswick-Holstein," however, being a combination of words falsely devised by the ringleaders of the first insurrection of 1848, unheard of before, and just as unjustifiable by any existing relations as a Canada-Holstein would be,—has of late assumed such an importance in the great events of the present age, and in the European politics, as to lead your humble servant, who is addressing you, to believe that an impartial elucidation of this somewhat intricate controversial point, based upon incontrovertible historical facts, would not be altogether unprofitable. However, before entering upon the survey of the merits of the question, let it be clearly understood, that I will not attempt to give even a sketch of these two disputed provinces before the dawn of authentic history, as I would then be obliged to examine a number of hypotheses, that, after all, would prove inconclusive. Nevertheless, the importance, and at the same time, the complication of this subject, make it incumbent on me to treat it with some extent, and to bring together, with the utmost care, all the feeble and scattered rays which may throw any light upon it, serve to bring order out of confusion, and view the whole question in its naked reality.

The history of the two dukedoms—Sleswick and Holstein—is like the history of human achievements,—a history of great results from small beginnings. For centuries Sleswick has been subject to the rule of the Danish kings. Sleswick was anciently called Anglia, held as a Danish Province of the Danish Crown, ruled according to the code of the Jutland law-book, given by the Danish king, Waldemar the Second, in the year 1239, up to this very

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day an *almost* entire Danish-speaking Province, with the exception of the southern districts, where only German is spoken, and considered by all European powers and treaties an inseparable part of the Danish body. *Holstein*, anciently called *Northalbingia*, being, it is true, a male fief of the German Empire, was at times subject to the Danish kings as Counts of Holstein, at other times as Counts independent of Denmark, until the year 1459, A.D., when the Danish king and his successors' *male* descendants were elected Dukes of Holstein, an election ratified by the German Emperor, Frederick the Third, who then, upon the request of the Danish king, Christian the Third, elevated Holstein from an Earldom to a Dukedom. Violently to wrest these two provinces from the crown of Denmark, to annex the entire Danish province Sleswick, to the German Confederacy, to which it has never belonged, and by its close annexation to Holstein, to create a large so-called Sleswick-Holstein Dukedom, which was to be entirely severed from the Danish crown for all time to come, was the object of the scandalous crusade waged against Denmark in 1848, and the two subsequent years, by the treacherous Duke of Augustenburg, the ringleader of the rebellion, and supported well nigh by all Germany,—the knavish duke, though nearly related to the Royal Danish house, and having sworn allegiance to the Danish king, having already long, through a host of periodicals, secretly sown that seed of discord which now commenced to break out into acts of violence,—a crusade, however, then crushed by the undaunted bravery and perseverance of the Danes, and resulting in the maintenance of Denmark's independence, nationality and ancient territories, the result thus proving that the Danes, only a handful of people when compared with all Germany, had not degenerated from the well-known bravery, constancy and intrepid spirit of their fearless ancestors, the grim-visaged Seakings and bearded Vikings, the result at the same time confirming the truth of the words of the royal sage of Israel, that the battle is not always to the strong, but to whomsoever the Lord willeth to exalt. But a new crusade from Germany, based upon the same villainous

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principles as the former one, began in the beginning of last year —1864—again to threaten Denmark's independence, integrity and nationality, and consummated, I grieve to say, its nefarious designs. Little Denmark being rendered no assistance from her allies, and although wont to defend herself bravely against two, and not yield to three, as the old sagas tell, could, however, not withstand the innumerable company of Prussians inundating the Danish dominion, and committing the most remorseless crimes and cruelties.

But I now propose to let history speak somewhat in detail, and an intelligent audience may then judge for itself. Charlemagne had with violence compelled the Holsteiners, then called Saxons, to embrace Christianity, and thus deprived the people of its independence. But the daring and efficient *Godfred*, King of Denmark, protected Holstein and commenced war. Making large progress, and even threatening to visit Charlemagne in his residence, Aix-la-Chapelle, the Emperor was happy enough to get rid of that intelligent and brave enemy—Godfred, unfortunately, being treacherously killed by one of his own people. His successor, *Hemming*, made peace with Charlemagne in the year 811, A.D., by which peace the *River Eider*, which separates Sleswick from Holstein, was appointed the limit between Denmark and Germany, and in the year 920, A.D., Thyra Dannebod, the queen of the Danish king, Gorm the Old, founded the celebrated *Dannevirke*, a fortified wall of earth and stones across Sleswick, strengthened by moats and tower bastions, to protect Denmark against inroads of the Germans. Already Godfred, recently mentioned, had erected a similar fortification, called *Kurvirke*, but the irruption of the German Emperor, Henry the Fowler, had proved that the country needed a stronger bulwark, wherefore the queen, Thyra, founded the famous Dannevirke. But Sleswick bordering on Germany, the German Emperors were continually eager of getting possession of this fertile province, when finally in the year 1026, A.D., *Canute the Great*, King of Denmark and England, visited the German Emperor, Conrad the Second, whom he induced to renounce for himself and his successors all future claim to the Margraviate

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of Sleswick, as it then was called. In the 12th century the Margraviate of Sleswick was mercilessly dealt with by the Venders (Venders or Vandalians, a rapacious set of pirates occupying the coast of the Baltic right from Denmark up to the Gulf of Finland), till at length the warlike and able Danish prince, *Canute Lavard*, a son of the Danish king Eric the Good, conquered the Venders, and not only secured the Margraviate of Sleswick to the crown of Denmark, but prevailed upon the German Emperor, who by virtue of his dignity as Roman Emperor, was acknowledged the secular head of the whole Christian world, to elevate Sleswick to a Dukedom, and procured for himself the dignity of a duke; and the ducal dignity of Sleswick has since invariably been invested, either in the Danish king himself, or in whomsoever of his relatives he was pleased to invest it, the dukes, of course, always taking the oath of allegiance to the Danish Crown. Thus the Danish King, Canute the VI., made his brother Waldemar Duke of Sleswick; Eric Ploughpenning made his brother Abel Duke of Sleswick, and so forth. Nevertheless this system of dividing Sleswick amongst the king's brethren or relatives, a system adopted and adhered to for a long series of years, was, of course, pregnant of the most ruinous consequences to the solid interests of the Danish body, contributing very much to the declension of the kingdom and to the diminishing of the royal power; and especially in reference to Sleswick this system of division had disastrous consequences, for Abel, recently mentioned, and his successors, tried now to make Sleswick an hereditary and independent possession in their family, all of which resulted in a series of destructive internal wars, Sleswick thereby more and more being alienated from the Kingdom. Under these circumstances, Abel soon assumed a hostile position to his brother Eric, the king, the more as he claimed the Dukedom of Sleswick as an independent sovereignty. Abel assasinated his brother, the king, who left no male issue, and the states, though detesting Abel on account of the unnatural crime he had committed, chose him king to avoid a civil war. By these means they also indisputably reunited the Dukedom of Sleswick

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to the Crown. If the royalty had remained in Abel's family, Sleswick would, of course, have been reunited with the kingdom, and all future contests prevented; but Christopher I., the third son of Waldemar the Conqueror, was happy enough after Abel's death immediately to be acknowledged king, although the throne was promised to Abel's sons, Waldemar and Eric. Both parties exerted all their power to gain the ascendancy. The king encompassed Sleswick with his army and claimed as uncle, the guardianship of Abel's children, but these were supported by the Counts of Holstein. Seasonably for the king, some of the German princes offered their mediation, a peace being concluded on these terms, that Christopher, the king, should have the guardianship, but restore the Dukedom of Sleswick as a fief to Weldemar, the eldest son of Abel, when he had attained his majority. After the death of this Waldemar the kingdom was soon after alarmed by a dangerous irruption of Eric, the second son of Abel, because the then King of Denmark, Eric Glipping, would not comply with giving him Sleswick as an hereditary fief, but only as a personal, joined the Counts of Holstein, and commenced a war in which the royal troops were totally defeated at *Loheath*, 1261 A. D., close by the city of Sleswick. Eric continuing to sow the seeds of dissension, the king reëntered the dukedom with a powerful army, and seizing upon the fortress of Tönder, which he razed, the rebellious duke was constrained to submit, and lost his dukedom a short time before his death, after which Sleswick for thirteen years remained united with the kingdom, until unfortunately again Waldemar, a son of the rebellious Eric, was, according to the aforesaid ruinous system of division, invested with Sleswick as a fief. But not content with it, he now also laid claim to Arö, Alsen and Femern, three islands in the Baltic. He fell, however, into the hands of the king, had humbly to throw himself at his feet, resign his brazen-faced claim, and make a confession in writing of his want of loyalty to his sovereign. Thus Denmark had for a number of years been the theatre of continual domestic wars with the rebellious dukes. In the year 1372 A.D., there was

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a good prospect of again getting the dukedom of Sleswick reunited with the kingdom, as Henry, the then duke of Sleswick, was old and childless, upon which important point the efficient and energetic king, Waldemar IV., in his last days directed all his attention; but unfortunately he only survived Henry so short a time, that the question could not be decided, but was deferred to the following reign. The great Queen *Margaretha*, the daughter of Waldemar IV., styled the Semiramis of the North, and *regina sine exemplo maxima*, now ascended the throne and aimed all her efforts at regaining the Dukedom of Sleswick, which circumstances had compelled her in the beginning of her reign to resign to Gerhard IV., Count of Holstein. For such a reunion of Sleswick a favorable opportunity appeared when Gerhard was killed in an expedition against the Friesers, leaving behind three sons in minority. Elizabeth, Gerhard's widow, fled to Margaretha for assistance against her violent brother-in-law, Bishop Henry, of Osnabrück. Margaretha, very fond of fishing in foul water, was very willing to help her, but availed herself of the opportunity to annex successfully different parts of Sleswick to the crown. The prosecution of her plan for the perfect reunion of Sleswick was unfortunately interrupted by her death, 1412 A. D., her imprudent and weak successor, Eric of Pomerania, having no vigour of mind to restrain the turbulent spirit of the three sons of the deceased duke, who took advantage of his inability, endeavoring to withdraw themselves from his authority, and to be enfeoffed with the Dukedom of Sleswick. At the diet of Nyburg the king summoned the young dukes to appear, and opened the Assembly himself with a full explanation of the circumstances of the dispute. When he had finished his speech the Archbishop, in a fulminating harangue, declared that the duchess-dowager, Elizabeth, and her brother-in-law, Henry of Osnabrück, as tutors and counsellors to Gerhard's children, had forfeited all right to the Dukedom of Sleswick in consequence of having, before Margaretha's death, taken arms against their lawful sovereign, and that Sleswick should therefore be annexed to the Crown of Denmark. No sooner had

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the archbishop pronounced this sentence than the eldest son of the deceased duke, Gerhard, threw himself at the king's feet and besought him to grant the investiture of the dukedom as a fief; but the king replied in the negative. The three young dukes now began to concert measures for shaking off his yoke; and although Eric of Pomerania had the military power of three large kingdoms at command, and marched an army of one hundred thousand men against them, he was defeated near *Immervad* in Sleswick, with great loss, insomuch that his flight became a proverb—"At Immervad the Danes were driven to the devil." Although this defeat did not terminate the war, it produced a truce in order to settle preliminaries for a peace. Arbitrators were chosen, and the whole affair of the Dukedom of Sleswick was again canvassed. Nevertheless the young dukes embraced every opportunity to frustrate the intention of the truce, and chose to decide the difference by the sword. The king perceiving their aim, now took the course of appealing to the German Emperor, Sigismund, and repaired to Ofen, in Hungary, where the Emperor then resided. Construing the appeal in favor of the king, the Emperor declared that all Sleswick should henceforward be annexed in full right to the Crown of Denmark, and that the dukes Henry, Adolphus and Gerhard had, by their rebellious conduct, divested themselves of their rights to Sleswick. The king now believing the whole dispute to be settled, resolved upon a pilgrimage to Palestine. But after returning he found the ancient leaven of contest revived and violently fermenting in the minds of the dukes, who making alliance with the Hanse-towns, a mighty league in the northern part of Germany, continued the war; and although king Eric collected all his strength to oppose the dukes, and even gained a complete victory over the Hanse fleet, yet at last they got the better of him, and weakened the kingdom by the most destructive ravages. However, their attempts to seize upon Copenhagen failed, the city being saved by the bravery and intelligent preparations of his queen Philippa, a daughter of Henry V. of England. At length the unlucky war with the dukes was

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ended by the treaty of Wordingburg, 1435 A.D., by which Adolphus, the only one yet alive, and his heirs, should be invested with the Dukedom of Sleswick, Denmark thus again being dispossessed of Sleswick. Finally a surer prospect than ever before of reuniting Sleswick permanently with the kingdom, and thus of terminating the incessant quarrels and contests, presented itself at the death of this Adolphus, called Adolphus VIII., who died without issue in the year 1459, A.D., but instead of incorporating it as an escheated fief, *Christian I.*, then King of Denmark, the first king of the House of Oldenburg, very unwisely engaged himself in negotiations with the nobility and the clergy to be elected Duke of Sleswick and Count of Holstein, to which latter, however, Otho of Schaumburg was more entitled; wherefore he had to purchase Holstein for the sum of 43,000 florins, and to buy off the pretensions of Gerhard and Maurice, nephews of the late Adolphus, for an equivalent of 40,000 florins. Thus Christian I. became Duke of Sleswick and Count of Holstein, which now, as above mentioned, was elevated from an earldom to a dukedom, the representatives of the political body of Holstein binding themselves to choose their following dukes amongst the Danish kings and their successors (*male heirs*), according to the Salic law. This year, 1459 A.D., is therefore an essential year in the history of the Dukedom of Holstein, the stipulation showing that the kings of Denmark should be dukes of Holstein, *as long as they left male issue.* Of Sleswick not one word was spoken in this stipulation, it being regarded for centuries back as pertaining to the Danish kingdom. One should now think that the ruinous consequences which the system of dividing Sleswick among the king's brethren and relatives had had, would have taught the following kings a lesson, but no, they all seem to have been blindfolded and deaf to the lessons of experience, for Christian III., in many respects an excellent ruler, undertook, about 1547, a new division amongst his brethren, although the old and expert general John Ranzau, strongly advised against this imprudent step. Owing to these divisions and parties the affairs in Sleswick and

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Holstein continued to take a disastrous turn for Denmark, and occasioned sanguinary national wars, the kings often not knowing how to keep the rebellious dukes within due bounds. The fatal division of the two dukedoms was again continued under *Frederick II.*, and so it went on. It is easy to see of what vast detriment these divisions were to the solid interests of the Danish body.

At length all controversy concerning Sleswick was brought to a close by the treaty of 1720, A.D., when Sweden, who had sided with the then rebellious duke Frederick, pledged himself no more to assist the duke, and England and France guaranteed to Denmark the Dukedom of Sleswick, binding themselves to defend Denmark's right to it against all who directly or indirectly should dare to invade it. And seven years after, 1727 A.D., a special treaty was signed by the two powers, England and France, to which Russia acceded, binding themselves to oppose by an armed force, by sea and by land, all and sundry the powers who should dare attack the Danish Dukedom of Sleswick. As to Holstein, being a male fief of the German Empire, it had, of course, its final court of Appeal in Germany, while Sleswick held of the Danish crown as a Danish province, was never called to a German diet, and in law questions the appeal has invariably been to its own Supreme Court. Hence it follows that Holstein is a German Province, whose duke is the King of Denmark, and his male heirs, according to the stipulation of 1459, A.D., above stated. Various changes, however, took place in the sequel, in consequence of the division of the ducal families into different branches, and the subsequent extinction of collateral lines, and it was not before the year 1750, A.D., that the whole came permanently under the Danish sway, when Adolphus Frederick, the elected successor to the Swedish throne, and the head of the younger line of the Dukes of Holstein, engaged himself to exchange the ducal part of Holstein for the two counties of Oldenburg and Delmenhorst, Denmark thereby coming into an undivided possession of Holstein. Some years after, about the year 1779 A.D., also, the Glücksburg possessions of Sleswick at the death of the last duke, by inherit-

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ance devolved to the Danish crown, and all the small parcels of Sleswick, which by earlier division had been separated from the crown, were reunited to it, except the possession of the Duke of Augustenburg. As Duke of Holstein, the King of Denmark had a seat in the German diet, but on the dissolution of the German Empire, 1806, that feudal obligation, in which Holstei n had been to the German Emperor ceased, as no such personage then existed, and Holstein was incorporated as a part of the Danish monarchy. However, on the formation of the German Confederacy in the year 1815, at the General Congress of the allied powers at Vienna, the Danish king, Frederick VI., was present himself, and subscribed there to the re-incorporation of Holstein into the German Confederation, upon condition that he himself, and his lineal male heirs continue to be Dukes of Holstein, and as such be members of the Confederacy, having three votes in the full Council, and binding himself, if need be, to furnish a contingent of 3,600 men, and to rule Holstein, being a male fief of Germany, according to its peculiar German laws, all of which that noble and simple-hearted monarch faithfully fulfilled. At the above-mentioned Congress at Vienna, no single syllable was spoken of Sleswick, it being considered an entire Danish Province, and an inseparable part of the Danish monarchy.

Since the Congress of 1815, the peace of Denmark was not interrupted till 1848, when the treacherous Duke of Augustenburg —the only surviving lineal descendant of the Dukes of Sleswick— revolutionized the two dukedoms, Sleswick and Holstein, and tried to shake off the Danish yoke, as he called it, and erect for himself an independent *Sleswick-Holstein State.* That victory which in the beginning of 1848 had followed the popular commotions of France and Germany, was an inducement for him to make the two dukedoms revolt. The language in which he clothed his hellish machinations was, "The Danish Government has oppressed the dukedoms, treated them step-motherly, and the new ministry appointed by the new king, Frederick VII., is hostile to their privileges"; all, at least at that time, entire moonshine.

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On the the 24th of March, 1848, he wrote a message to Copenhagen, "Sleswick-Holstein, twenty-four hours ago, became an independent State, shook off the Danish yoke, and appointed a provisional government." On the 25th of March the Duke of Augustenburg arrived in Rendsburg, and the insurgents assembled under the command of his brother, Prince Frederick. A sanguinary three years' war was now waged against Denmark, the insurgents being assisted by more than 20,000 Prussians and Hanoverians. What did England now do? Did she act according to the great covenants of 1720 and 1727? No, she did not. All the time it was said: England is negotiating! *Mirabile dictu!* What was there to negotiate about? Negotiating! while she was bound by sacred treaties to protect the dukedom of Sleswick from all invasion. France acted no better. Russia was the only power which, in accordance with the great covenant, did something, and little enough, to vindicate Denmark's right. Little Denmark had to do the business alone, and struggled hard, but successfully, to maintain her integrity against the rebellious dukedoms, and the legions of Germany. England and France remained quiet beholders of all the innocent blood that manured the fields of Fredericia, Düppel, Idsted, and so forth. Denmark had, I regret it, to do it alone; did it, defeated the insurgents and the German troops almost in every engagement of any consequence, crushed the rebellion, regained the authority over the rebellious dukedoms; and May 8, 1852, a treaty was concluded in London, between Denmark, Norway, Sweden, England, France, Russia, Austria and Prussia, guaranteeing the integrity of the Danish monarchy, setting aside the line of Augustenburg, because of the duke's treacherous conduct, and settling the succession to the Crown of Denmark, and to the Dukedoms of Sleswick and Holstein upon the loyal Prince Christian of the Glücksburg line, and his male heirs, upon whom in the next year, 1853, according to a law passed in the diet, and subscribed to by the king himself, the title of *Prince of Denmark* was conferred, his civil list being fixed to the amount of 50,000 rix-dollars annually. On the 15th of November,

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1863, the King of Denmark died without issue, the throne, according to the treaty of 1852, recently mentioned, devolving to Prince Christian, the father of the Princess of Wales, who immediately was proclaimed King of Denmark and Duke of Sleswick and Holstein, under the name of *Christian IX.* But I must bestow a few words more upon Prince Christian, the present king, the father of the Princess of Wales, and upon the scandalous Duke of Augustenburg, and my words concerning them I quote from the Edinburgh *Quarterly Review*: "The Prince Christian, of Glücksburg, stood as a descendant of Christian III, high in the male succession, and most of them who stood before him, had been guilty of treason in 1848, and had rendered themselves liable to forfeiture of all their rights. The treasonous Duke of Augustenburg, who also stood nearer to the succession to the throne than Prince Christian, had of course fled the country, and had to renounce all claims to his estates. Nevertheless, for the cession of all his claims, he received from the liberal Danish Government a sum of rather more than £400,000 sterling. In consideration of this for a traitor, guilty of high-treason, enormous indemnity, the knavish duke made the following promise in writing:—'We promise for *us* and our *family*, by our princely word and honor, not to undertake anything, whereby the tranquillity of His Danish Majesty's dominion and lands might be disturbed, nor in any way to counteract the resolutions, which His Danish Majesty might have taken or in future might take, in reference to the arrangement of the succession of all the lands now united under His Danish Majesty's sceptre, or to the eventual organization of His monarchy.'" And now the Edinburgh *Quarterly Review* continues: "In the vocabulary of the Duke of Augustenburg, it is, of course, to be presumed, that the word, '*family*' does not include sons, since it is just his son, who is now, 1864, revolutionizing Holstein. It is, however, right to state that said son has protested against the above renunciation; but it is also right to add, that this illustrious offspring of a glorious father kept his protest to himself till six years after the

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deed had been signed, and the enormous sum of money paid. Pretty smart piece of business!" Thus far the *Quarterly Review*. But what did now the perfidious Duke do? After having pocketed the enormous sum of money, and after having given that sublime and affecting declaration, you recently have been listening to, he made it his business to travel round in Germany, and by fulminating speeches and periodicals to fan the flame of rebellion against his fatherland that had nurtured him, intending to grasp the very first opportunity to recommence his former schemes for establishing for himself and family a large and independent Sleswick-Holstein Dukedom. Such an opportunity offered itself, when the King, Frederick the Seventh, had breathed his last. Instantly the perfidious duke, in spite of the money paid him for the cession of all his claims, and in spite of his solemn declaration, put in claims in favor of his son, Frederick, in order to dislodge the new king, the father of the Princess of Wales, from his position as duke of the two fertile dukedoms; and alas! he was this time too successful. The horsemen and all the host of the Prussians and Austrians rushed upon old Denmark, under pretence of vindicating the rights of the dukedoms, of incorporating them into the Germanic Confederation, and then of making the son of the nefarious duke their duke, but secretly intending, after the conquest hoped for, to overlook both the son and the duke and the Germanic Confederation in the division of the spoil. Hoping that also this time no foreign aid would be rendered to little Denmark, the Prussians and Austrians, confiding in the overwhelming forces they could bring to bear upon the conflict, and in their superior artillery, entertained a glorious anticipation of a complete victory. Certainly, the proportion between the military power of Prussia and Austria and that of little Denmark, was as one to fifty. As the cause of their attack upon Denmark was given that the Danish Government had treated the dukedoms as conquered provinces, and had forced the Danish language upon Sleswick. Perhaps Denmark is somewhat to be blamed in this respect, but having been absent now for a number of years, I am

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unable to decide this question with any certainty. At all events, Prussia and Austria had no business to intermeddle with His Danish Majesty's rule of his own dominions, as little as Denmark has any business to intermeddle with the French Emperor's rule of his German province Elsass. The Danes, with all good reason considering themselves most outrageously treated, and always accustomed to stare an enemy right in the face, bravely to attack two, and not yield to three, and expecting, according to the treaties of 1720 and 1727, and the London treaty of 1852, British and French aid, rushed into the conflict with the thrilling excitement which nerves the arm and steels the heart of soldier and seaman. The Danish army marched down to meet the Prussian and Austrian legions and the fleet was launched into the Baltic, and the defence of the Danes all the time, of course, against superior numbers, ranges high, say the English papers, in the annals of warfare. On the second day of February last year, 1864, they gave such evidences of old Northern valor and bravery as may be sought for in vain even in the annals of the Romans and Carthagenians; the innumerable multitude of Prussians and Austrians, says the English press, stormed, and stormed, and stormed, again, and again, and again, but were each time received with such murderous fire from the Danes, that they had to give up, eleven hundred Prussians and Austrians covering the bloody battle field. But now the Austrians and Prussians poured in like a host of locusts, and there was very little, or better to say, no prospect of success for Denmark. Nevertheless, the Danes would not give up, but continued fighting against vastly superior numbers, hoping confidently, when worst came to worst, for British and French aid. But alas! they were greatly and bitterly disappointed. Certainly, the whole British nation was greatly and deeply interested in the fate of their ancient kinsmen, but how the British government felt in this respect, I don't feel at liberty to say. Lord Russell held out the most glorious promises, issued threatening notes against Germany; the English papers wrote, "Take heed to yourselves, believe,

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we are in earnest," and so on. However, nothing was done for the assistance of Denmark, or for redressing the enormous wrongs inflicted upon her. She was left alone, was overmatched, brutally treated, and had to give up. The Prussians even went so far as to invade the peninsula of Jutland, where they committed such acts of merciless ravage and depredation, even unheard of in the time of the Vandals. I shall, however, pass over the details of the ruthless havoc they perpetrated, a havoc which continued until the peace of October 30th, last year, was concluded, in which Denmark lost the two fertile provinces, which had belonged to her for centuries. The peace-document, dictated by Prussia and Austria, has the blasphemous superscription: "In the name of the holy and indivisible Trinity."

Ladies and Gentlemen! I will not pay you so ill a compliment as to imagine that you can remain any longer in the slightest doubt as to the truth of the proposition, which it has been my main object in my discussion to establish, provided you think me honest enough to have stated the full historical truth. Little Denmark is deeply agonizing at this very hour, but her hopes for brighter days, she will not, she cannot forego. "On the very verge of ruin," said once the great statesman, Talleyrand, "the Almighty has always a miracle in His pocket to save thee, noble Denmark." Acquiescing in this conviction, I look safely forward for the fate of Denmark, the place of my nativity, where my cradle was rocked, where I received blessings upon blessings, and the ingrafted divine word, which is able to save souls, and I shall allow myself to conclude this speech with the language of the gifted Norwegian orator and divine, the Rev. W. H. Wexels: "Live the gallant warrior Danes, live the warmhearted people of the champaign country, live it in spite of all direful German prophecies of destruction and annihilation. Vivat Dania! Vivat!! Vivat!!!"

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PAPER VI.—SHORT SCHOOL TIME—WITH MILITARY OR NAVAL DRILL—IN CONNECTION ESPECIALLY WITH THE SUBJECT OF AN EFFICIENT MILITIA SYSTEM.*

BY E. A. MEREDITH, LL.D.

(*Read before the Society, 1st April, 1864.*)

In 1860 a Royal Commission was appointed in England to report upon the state of popular Elementary Education in that country. The Commission included the names of the late Duke of Newcastle, Mr. W. Nassau Senior, and many other eminent educational reformers, peculiarly qualified for a work of such national importance. The results of the Commissioners' labors are contained in six bulky volumes, which form a valuable Repertory on the subject of National Education.

Without at all undervaluing the importance of the labors of the Commissioners, it may be safely asserted that no part of their able and voluminous report is so suggestive, none so certain to bring about eventually a radical and permanent revolution in the whole system of education, as the short and unpretending communication, published in the appendix, addressed by Mr. Edw. Chadwick to Mr. Senior.†

It is to this paper of Mr. Chadwick, and to a subsequent explanatory letter from him on the same subject, also addressed to Mr. Senior, that I am mainly indebted for the facts and arguments which follow.

The object of Mr. Chadwick's paper is to establish that in ordinary public schools, too much time is devoted to book instruction, too little to the physical training of the pupil; that the mind

* The substance of this paper appeared in a letter addressed by the author to the Editor of the *Morning Chronicle* of this city, and published 25th June, 1862.

† Half-school time, and Military and Naval drill in Public Schools.

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is overworked—the body insufficiently exercised; that book-work is generally prolonged much beyond the capacity of the pupil, to the injury alike of his physical and mental powers. He further asserts that it is demonstrable, nay that it has been demonstrated by actual experiment, that by employing in the physical training of the pupils, more particularly in systematic military and naval drill, a portion of the time, now uselessly or hurtfully misspent on books, incalculable benefits, physical, moral, intellectual and economical, will result to the persons taught, and, as a matter of course, also to the nation.

The startling novelty of Mr. Chadwick's views, and the very magnitude of the benefits which he claimed as certain to follow from the general adoption of the plan of Education which he had inaugurated, had a tendency to make most people incredulous of the project, if not to reject it altogether as Utopian. The high reputation, however, of Mr. Chadwick, who had been for upwards of a quarter of a century an earnest and able laborer in the cause of social reforms, especially in matters connected with popular Education, would have amply sufficed with all thoughtful men to secure a respectful consideration for any opinion, however strange or paradoxical, which had received the sanction of his advocacy. But Mr. Chadwick did not rest satisfied with mere opinions or arguments in support of his views. He gave hard, unanswerable facts—facts sustained by the concurrent testimony of the most intelligent and experienced school teachers and of some of the most able military men in Great Britain.

Mr. Chadwick's revolutionary theories, for such in truth they were, gave rise, as might be expected, to no little discussion in England. France and Germany, and other European countries, took up the question, and on this continent too, especially among our practical neighbors in the States, Mr. Chadwick's views attracted not a little attention. Here, and there too, but particularly in England, the system was put to the true test, that of actual experiment. And it may be asserted, beyond controversy, that all the discussions which have taken place upon the merits of

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Mr. Chadwick's system, all the experience of its working, wherever it has been fairly tried, have alike served to establish more and more its infinite superiority over the old *regime*.

It cannot fail to strike us as passing strange that after so many centuries of experience in Great Britain, and everywhere throughout the civilized world, of various systems of popular education, after the countless volumes which have been written on this, the most important of all social questions, we should find ourselves, at this age of the world, in the middle of the nineteenth century, debating about the primary and fundamental principles of the science of education. It might reasonably be supposed that the whole subject had been long since exhausted, that the grand principles of education had been absolutly established, and set at rest for ever. But this is far from being the case; on the contrary, it has very recently been asserted with truth that: "Many of the very vital points of education, the education of the higher and the lower classes, are still, to a great extent, open questions."

In every scheme of education, whatever may be its peculiar objects, whatever the particular means selected for carrying them out, there is clearly one question which meets us at the very threshold, and which demands a categorical answer: "What is the amount of time, the number of hours per day, during which children may be profitably employed in acquiring instruction?" in other words: "What are the limits physical and psychological of a child's capacity of attention?" And yet this all-important and most natural preliminary question, is the very one which has, within the last few years, been formally mooted, apparently for the first time, by Mr. Chadwick.

It is, happily, unnecessary to enter into any elaborate argument as to the paramount importance of every thing connected with the subject of national education. To the general proposition that national education is a topic of the highest importance to the State, all are prepared to give a willing assent. But yet it may be doubted whether many fully appreciate the momentous import of the subject; how, in a manner, it embraces and involves all other great social questions. It is, in truth, the question of

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questions. All the perpetually-recurring social problems, mendicancy, pauperism, crime, physical deterioration, habitual juvenile delinquency, and insanity itself, are ultimately connected with, if not in some sort different phases of, this great primal question? Can it be gainsaid that all the social plagues in this melancholy catalogue arise in a very large degree from defective early education? Remedy the defects in popular education, and you, *pro tanto*, diminish all the unnumbered evils of which these defects are the fruitful parent. This, therefore, is the great question to which, before and beyond all others, statesmen, legislators, philanthropists, and economists, should direct their most earnest attention. To promote the cause of general education is an object worthy the ambition of the noblest minds; one for which every true lover of his kind might well be content

"To scorn delights and live laborious days."

The schools established for the factory children under the provision of the Short-time Factory Bill,* were the first in which the half-time teaching was established, and it is in the astonishing success which has attended these half-time schools, when *provided*

* It is a curious and interesting fact, that the first experiment upon a large scale, of Mr. Chadwick's reformed system of education, was intimately connected with, and in fact was the incidental result of, another important effort, of a very different kind of which Mr. Chadwick was also the author, for the benefit of the youthful population of England; the effort, namely, to protect the children of the poorer classes from being overworked in the factories.

When the bill for limiting the hours of work of children in factories was before the Legislature, the Government called upon Mr. Chadwick, who had given much attention to the whole subject, to prepare the details of the measure. In doing so Mr. Chadwick inserted provisions for the limitation of children's labor in factories to six hours; ten hours being the time originally proposed; and further, principally, however as a *security against overwork*, he inserted a provision in the bill that all children, while employed in factories, should be three hours each day under a competent school teacher. Mr. Chadwick was himself persuaded, from his own information and experience, that the time thus allowed for the purposes of instruction was really as much as could under any circumstances be profitably devoted to it; but the primary object of the provision was to secure for the children bodily rest rather than mental education. By providing that the children should be three hours daily in the school room, he secured effectually three hours absence from the factory. Whether anything was learned in the school or not, the poor factory children being there, gained at least one thing—a short respite from their daily toil—they no longer were as before,

"From morn to midnight tasked to earn their little meal!"

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with properly trained and competent teachers, that Mr. Chadwick finds the most powerful argument in favor of his system. Thus from the philanthropic effort to rescue the overtasked children of the poorer classes from the evils inflicted on them by excessive *bodily* work, has arisen another and even more important and comprehensive school reform—one which will embrace the children not only of the poorer, but of the middle and upper classes—a reform which has for its object to relieve all children who attend schools from the evils resulting from over *mental* work. The same general principle lies at the root of both the reforms in question, namely: "That working young children during the same stages as adults is always injurious overwork for young and growing children, whether the work be mental or manual."

We shall now proceed to point out some of the evils, so far at least as over mental work is concerned, of the system of education usually followed in our public schools, and we shall then explain the half-time system more in detail, noting the sort of physical training—military and naval drill—which Mr. Chadwick advocates; and lastly, the enormous benefits to the individual and the nation which may be expected to flow from the general adoption of the new system; under the last head will be described, at some length, the important bearing of the proposed reformation in our school system upon one of the great questions of the day in Canada,—the question, namely, of our national defences.

First, then, let us consider briefly the routine of education at present pursued in the majority of our public schools, and examine what are its effects upon the mental and bodily health of those who are subjected to it.

We shall here quote the words of a recent able writer in the States, who has discussed this subject with reference to the school system of the Union. His remarks, however, are as applicable to the school system of Canada as to that of the United States:—

"Six hours a day, for the most part, is the allotted school time in this part of the country. Occasionally we find it five, and as often probably seven. The rooms, with some exceptions, are badly warmed and badly ventilated, the thermometer ranging, in winter, from 55 to 80, and the

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air contaminated by the respiration of one or two hundred pairs of lungs, and the impurities that arise from a leaky, over-heated stove or furnace. The time not devoted to study is occupied in recitations, or exercises that require a considerable degree of mental activity. To accomplish all the tasks, the regular school hours are seldom sufficient, and more or less time must be given to study out of school. It may be a single hour; it may be two, three or four. The time will be determined by the amount of the tasks; by the ambition, capacity or excessive anxiety of the pupil. With quick-witted children, who have no very strong desire to excel, and those who have neither desire nor capacity to excel, it is short. On the contrary, with the sluggish, but conscientious intellects, with the ambitious who strive for distinction, and the morbidly sensitive and timid, it is long."*

The author from whom I have quoted then gives several examples of the lessons learned in a day in several public schools taken at random, and adds:—

"These may be considered as average examples of the amount of work now put upon the youthful brain. They are the first that came to hand, but I have reason to believe that additional statistics of this kind would oftener show a larger than a smaller requirement. They will enable every one to judge for himself with sufficient accuracy, whether the strain to which they subject the mind, is or is not, compatible with the highest degree of healthy endurance.

"In connection with this matter of out-of-school study, it must be considered that much of it is pursued in the evening, often until a late hour, —a practice more pernicious to the health, in youth or adult, than any other description of mental exercise. The brain is in no condition for sleep immediately after such occupation. The mind is swarming with verbs and fractions and triangles, and a tedious hour or two must pass away before it falls into a restless, scarcely refreshing slumber. Jaded and dispirited it enters upon the duties of the day with little of that buoyancy which comes only from 'nature's sweet restorer.'

"Thus it is that in all our cities and populous villages, the tender mind is kept in a state of the highest activity and effort, six or eight hours a day, for several years in succession, with only such intervals of rest as are furnished by the weekly holiday, and the occasional vacation. Sunday can hardly be admitted among these intervals, for that day has also its special school, with its lessons and rewards. In other words it is subjected to an amount of task-work which, estimated merely by the time it requires, is greater than what may be considered a proper allowance to a cultivated adult mind."

It scarcely needs to be proved that such a mental strain as this upon the youthful mind must be injurious. We hardly require the testimony of a medical man to the fact: "That the young and adult brains possess very unequal capacities of application and endurance," or that "it is the law of the animal economy that the

* Dr. Ray. *Mental Hygiene*, p. 122.

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various organs do not arrive at their full maturity of vigor and power until some time after the adult age has been fairly commenced." To expect the same amount of mental endurance from a child of ten or twelve as from a full-grown man is about as reasonable as to expect the former to carry the same load, and for the same distance, as the latter.

But beside these evils to the mental health of children, resulting from the strain upon their mental powers, there is the physical evil resulting from the prolonged and unnatural physical restraint and sedentary confinement of children. We have high authority for stating that the enforced stillness of growing boys or girls in a school-room, however well warmed and ventilated, for five or six hours in the day, is a violation of the primary laws of physiology. The restlessness and inattention of the unfortunate little victims of our modern system, after a few hours schooling, their irrepressible eagerness to escape from their restraint, notwithstanding all the artifices of the teacher to interest them, might of themselves warn us that we are doing violence to nature. "The chief question," writes Dr. Schreiber, of Leipsic, is, "how are our children brought up? Is it according to the laws of nature? The answer is no, or we should not see so many children who were rosy and healthy before going to school, become pale and bloodless after attending school." Another writer says: "Nature commands children to play and romp, just as she does young colts and lambs. Pen them up in school, fetter their limbs, shut them out from God's sunshine and vivifying breezes, and what do we make them? Their physical integrity is certainly impaired, but is not their intellectual, nay, is not their moral integrity also affected by this unnatural and artificial system?" In their zeal for the mind, our modern educationists would seem to have altogether lost sight of the body. They forget that for the perfect man we must have the "*mens sana in corpore sano*"; they consider not that intimate "consent between mind and body," by virtue of which the former must suffer, if the latter is neglected.

In our modern system of education the physical training of

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children has, for the most part, been left altogether to nature or to accident. The evil effects of the system have, therefore, shewn themselves, as might have been anticipated, more among girls than boys; because the former are less likely than the latter to seek for themselves those out-door sports and amusements which counteract, to some extent, the injurious effect of excessive mental labor and bodily confinement.

But it may be alleged that we have exaggerated the evil effects of our present school system on the mental and physical health of the children attending school; we may be challenged to produce proof of our assertion. Innumerable instances are adduced of persons who have gone through the ordeal without any appreciable impairment of their mental or bodily health, and hence the inference is somewhat hastily drawn that the system is innocent of the evils which we have laid at its door.

On this point it will suffice to cite the opinion of Dr. Ray, who, from his well-known ability and large experience in mental diseases, is peculiarly competent to speak with authority upon the subject:

"The manner in which the evil (resulting from excessive mental applilication in schools) is manifested, is not very uniform, but however various the results, they agree in the one essential element of a disturbed or diminished nervous energy. It rarely comes immediately in the shape of insanity, for that is not a disease of childhood or early youth. It impairs the power of concentrating the faculties, and of mastering difficult problems, every attempt thereat producing confusion and distress. It banishes the hope and buoyancy natural to youth, and puts in their place anxiety, gloom, and apprehension. It diminishes the conservative power of the animal economy to such a degree, that attacks of disease, which otherwise would have passed off safely, destroy life almost before danger is anticipated. Every intelligent physician understands that, other things being equal, the chances of recovery are far less in the studious, highly intellectual child than in one of an opposite description. Among the more obvious, and immediate effects upon the nervous system, are unaccountable restlessness, disturbed and deficient sleep, loss of appetite, epilepsy, chorea, and especially a kind of irritability and exhaustion, which leads the van of a host of other ills, bodily and mental, that seriously impair the efficiency and comfort of the individual.

"I have said that insanity is rarely an immediate effect of hard study at school. * * * When a person becomes insane, people look around for the cause of his affection, and fix upon the most recent event apparently capable of producing it. *Post hoc propter hoc*, is the common philosophy on such occasions. But if the whole mental history of the patient were clearly unfolded to our view we should often find, I apprehend at a much

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earlier period, some agency far more potent in causing the evil, than the misfortune, or the passion, or the bereavement, or the disappointment which attracts the common attention. Among these remoter agencies in the production of mental disease, I doubt if any one, except hereditary defects, is more common at the present time, *than excessive application of the mind when young*. The immediate mischief may have seemed slight, or have readily disappeared after a total separation from books and studies, aided, perhaps, by change of scence ; but the brain is left in a condition of peculiar impressibility which renders it morbidly sensitive to every adverse influence."

Is it not in consequence of this unduly severe mental toil together with the absence of proper physical training, that we find that many a boy of high promise, the delight of his parents, the *dux* of his school, is found to "unbeseem the promise of his youth" and turn out a very common place, if not a dull and heavy man? Is not this the reason why so many intellectual and interesting children are like medlars rotten before being ripe, and does it not supply us with the true answer to Dr. Johnson's query: "What becomes of all those prodigies?"

Before leaving this part of my subject it may not be out of place to note very briefly the great and characteristic difference in this particular between the modern system of education, and that which obtained among some of the leading nations of antiquity. It is curious and instructive to mark the different degrees of importance assigned to the physical part of education in the ancient and the modern world.

"Among the Persians" we are told, "the entire education of the youth from their fifth to their twentieth years was confined to three things: riding, shooting with the bow, and *speaking the truth*." Here Physical education is the chief, almost the only element, and mental education is not even mentioned. This is just such a system of education as we might expect to find among a people removed only a few degrees from the savage state. Advancing to times of civilization we come to the Greeks and Romans. Both these nations recognized, as we all know, the necessity and importance of mental education; and it formed, accordingly, an essential part of their system of education. But still physical training was by no means neglected; on the contrary, it was regarded

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as an essential if not the most important part of the training of the youth. The very names, indeed, of the Greek and Roman schools—*Gymnasia* and *ludi*—indicate places intended primarily for physical exercise.

Looking at the Greek and Roman plan of education we, with our modern views as to the paramount importance of intellectual culture, may feel inclined to impeach it as giving too much importance to physical training, to the disparagement or neglect of mental cultivation. But when we call over the bright muster-roll of poets, statesmen, orators, and historians which both of these nations produced, we must pause before we condemn the system of education which can point to such splendid results.

Mr. Chadwick refers with satisfaction to the fact that the authorities of the venerable University of Oxford have recently recognized the necessity of systematised bodily training in connection with the mental labor of the University, and expresses the hope "that we may have from the university an example of the revival of a really classical education, an education founded on the precepts of Plato, Aristotle and Galen, which divided the public education into three parts, of which one was for mental training in the schools, one for bodily training in the gymnasium, and the third tuition in accomplishments as music," &c.

Having dwelt so fully upon the grounds upon which Mr. Chadwick, and other educational reformers following in his track, have impeached the modern system of education, it is almost unnecessary to say that the remedies for the evil of which they complain are two-fold.

1st, A reduction to the proper limits of the time set apart in schools for book instructions; and, 2nd, Systematic physical training of the children; including in that training for the male portion of the school population, naval or military drill, or both.

The extent to which the time usually devoted in schools to book-instruction may be advantageously reduced is a question of detail which cannot probably be conclusively established until the

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half-time system has been submitted for a few more years to the test of actual experience. Mr. Chadwick, indeed, asserts, and the testimony of the able and intelligent witnesses examined by him, fully bear out the assertion, that the ordinary school hours may be reduced one-half, without, in the slightest degree diminishing the amount of book-instruction acquired by the pupil in a given time.

Without however attempting, here, to fix with mathematical nicety the precise number of hours during which book-instruction may be profitably carried on in schools: it may, at least, be laid down as an axiom that such instruction ceases to be profitable, and should, therefore, be given up, when the pupil is no longer able to give his entire attention to what is taught. The instant the pupil becomes fatigued and tired, the instant he loses the power of *bright voluntary attention* (as one of the witnesses aptly calls it), it is time to stop the lesson. Everything done after that is either unprofitable or hurtful, or both. If a boy makes an extraordinary effort to keep his attention fixed on the subject before him, when his capacity of voluntary attention is exhausted, the mental effort is injurious. If, on the other hand, the boy merely makes believe that he is attending to his lesson when his thoughts are on his marbles or his tops, he is acquiring a dishonest *moral* habit, that of pretending to do what he is not doing; a fatal *mental* habit, too likely to cling to him through life, of looking at a book without thinking of what he is reading, a habit of dawdling over work; a habit the very opposite to that which is so invaluable in real life, that of doing earnestly the business of the moment; of thinking of it and nothing else for the time, in obedience to the teaching of the golden maxim "whatever thy hand findeth to do, do it with thy might."

Of the *quality* of the mental training in our modern schools we have said nothing; our special object has been to protest against the *quantity* of mental work. For the purpose of the present paper it is, fortunately, not necessary to consider the much vexed question as to what constitutes the best kind of mental discipline for children; to determine, for example, whether

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mathematics, languages or the natural sciences form the best sort of intellectual gymnastics. This is not the place to enforce the truths, which are now happily beginning to be at least dimly recognized: that children should be made to learn as much as possible by and through their senses, by their own powers of observation: that when it is possible they should be made to study natural objects, the things themselves, rather than the signs of things—words: that the senses themselves, as well as the reasoning powers, should be carefully cultivated: and that the right education of our senses, especially of the eye, not only contributes much to our comfort and enjoyment in life, but, in the case of the working classes, adds very materially to their usefulness and efficiency, and consequently to their value as workmen.

I cannot, however, refrain from alluding, in passing, to the very narrow and mistaken view which many persons take of education. Physical education they wholly ignore, and of intellectual education they take a very one-sided view. With them intellectual education means nothing more than imparting to the child a certain amount of knowledge, and they gauge the value of education by the quantity of information acquired in a given time. Whereas the aim and object of education should be, as the word itself might teach us, to secure the healthy growth and development of the whole man—of all his powers and faculties, physical, moral and intellectual. The value even of the intellectual training which a boy receives at school or college is not to be tested solely or chiefly by the amount of knowledge he has acquired, the number of dates or facts he may have learned; but rather by the mental discipline he has undergone, the mental power and force he has acquired, the intellectual tastes and habits he has formed; not by the information he has stored up, but by his thirst for information, his power of grasping facts, his faculty of judging rightly; not in fact, by what he has done, but what he has the power and the will to do; not by what he is *in esse* but what he is *in posse*. The mistake to which I have referred, as to the objects of education has led to the "cramming" or forcing system

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which is the bane of modern education. We insist that everybody shall know everything. As one of our most delightful modern Essayists writes:—"We may in sober seriousness apply to the present age the remark which Sydney Smith, in the fulness of his wisdom and his fun, applied to the master of the Pantologies at Cambridge—'*Science is our forte; omniscience is our foible.*'" The advocates for this universal knowledge forget that the mind, as Montaigne says, must be *forged* rather than *furnished—fed* rather than *filled.* They forget that of the mental pabulum which we are forced to take at school, none is of any real use to us, but that portion (and it is generally a very homœopathic portion of the whole) which we can digest and assimilate and make to all intents and purposes our own. All the rest is useless, or rather it is worse than useless; because it tends to impair the tone and vigour of the mental faculties; just as an excess of bodily food weakens the digestive organs and impairs the physical health generally.

The second remedy for the evils of the present school system is to be found in a proper course of physical training for the pupil, including in that training (for boys) regular instruction in military or naval drill, or both.

It is almost needless to say that no system of physical education should supersede that voluntary physical training, those manly out-door games which are the delight and glory of the school-boy: cricket, foot-ball, prisoner's base, and all such field-games, are, in many respects, the very best possible physical training that a boy can have. But there are many schools where such games cannot possibly be resorted to, and what shall we do with these? Establish a system of gymnastics for them. I am quite willing to admit that when it is impossible to procure other exercises, gymnastics may be used advantageously for boys and girls, but I think there is a tendency now-a-days to over-rate the value of artificial gymnastic exercises, and to mistake muscular strength for health; and on this point I may quote the words of a recent able writer on physiology:—

"Gymnastics certainly encourage the development, and increase

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the power of certain muscles; and those who exercise their muscles in this way will be so far stronger than others. But it does not *follow that such persons are healthier than* those who take ordinary exercise. It is a remark as old as the time of Hippocrates, that men who practise gymnastics are in a dangerous state of health. They may increase the power of their muscular system, but, if they do so, it is at the expense of the rest of the body, and it was remarked of old, that the athletes and others, who practised gymnastic exercises, were subject to violent disorders, and seldom long-lived.

"It is difficult to prevent boys from taking too much exercise. During the period of growth great fatigue injures the general health. But even when gymnastic exercises are so managed as to avoid this inconvenience, and when they succeed in imparting to the boy an extraordinary degree of muscular development, I am perfectly convinced that the natural adjustment of the functions is thus prevented; for, however well fitted the frame of youth may be for feats of agility, nature has not adapted it for strength, the attainment of which she defers until the period of growth is passed; and, consequently, her plans are deranged, when muscular strength is artificially and prematurely obtained."*

But admitting, as I am ready to do, that gymnastics, *under proper regulations*, may be made useful for the bodily training of youth, for teaching boys the proper use of their hands and limbs generally, a matter of no slight importance; yet it would be found costly and difficult to introduce systematized gymnastics into the schools of the poorer classes; but, further, and this is a more important consideration, their usefulness would terminate in the physical benefits derived from them. Their intellectual and moral effects would be nil.

To occupy a portion of the time taken from book-instruction, Mr. Chadwick therefore advocates the introduction of regular military or naval drill, as affording, under every aspect, the best kind of physical training for the scholars.

* Graves' "Studies in Physiology and Medicine," p. 183.

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The paper which was submitted by Mr. Chadwick to the commissioners contains the evidence of a number of intelligent witnesses, principally school-teachers and military men, most of whom speak as to the results produced in schools, where the half-time system, accompanied by military and naval drill, had actually been tried. That evidence Mr. Chadwick triumphantly appeals to as establishing conclusively the great value of military drill, whether regarded with reference to: 1st, The present welfare of the individual pupil; or, 2nd, The interests of the nation.

As to the first head he holds that the evidence shews that the new system is attended with the following sanitary, moral, and economical benefits to the individual pupil. We quote Mr. Chadwick's words:—

1. *Sanitary.*—That the drill is good (and for defective constitutions requisite) for correction of congenital bodily defects and taints, with which the young of a very large proportion of our population, especially the young of the poorer town populations, are affected; and that for these purposes the climbing of masts, and other operations of the naval drill, and swimming, are valuable additions to the gymnastic exercises of the military drill, and when properly taught are greatly liked by boys.

2. *Moral.*—That the systematized drill gives an early initiation to all that is implied in the term discipline, viz., duty, order, obedience to command, self-restraint, punctuality, and patience.

3. *Economical.*—That it is proved, when properly conducted by suppleing the joints, rendering the action prompt as well as easy, by giving promptitude in concurrent and punctual action with others, to add, at a trifling expense, to the efficiency and productive value of the pupils as laborers or as foremen in after life.

The *mental* gain is not noticed by Mr. Chadwick in his first letter, but in the explanatory letter the author clearly brings out this point. "A boy," he says, "who has acquired the same amount of knowledge in one half the time of another boy, must have obtained a proportionately superior habit of *mental activity.*" And this is found practically to be the case; the employers of labor giving the preference to "short-timers" as against "long-timers" wherever they can make the choice.

On the second chief topic, as regards the interest of the nation; Mr. Chadwick argues that the general introduction of the drill is

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called for, and will be of the same use as was of old the parochial training* to the use of the bow, he holds that it is proved on practical evidence of officers engaged in the drill:—

1. That military and naval drill are more effectively and permanently taught in the infantile and juvenile stages than in the adolescent or adult stages.

2. That at school it may be taught most economically, as not interfering with productive labor; and that 30 or 40 boys may be taught naval and military drill at 1¼d per week, per head, or as cheaply as one man is now taught; that the whole juvenile population may be drilled completely in the juvenile stage, as economically as the small part of it is now taught imperfectly on recruiting or in the adult stage; and that, for teaching the drill, the services of retired drill sergeants, and naval as well as military officers and pensioners, may be had economically in every part of the country.

3. That the middle and higher class schools should have, in addition to the foot drill, the cavalry drill, which the parents of that class of pupils may afford.

4. That the drill when made generally prevalent (without superseding), will eventually accomplish, in a wider and better manner, the objects of volunteer corps and of yeomanry, which, as interrupting productive occupations, now becoming more absorbing, is highly expensive, rendering all volunteer forces dependent on fitful zeal, and eventually comparatively ineffective; that the juvenile drill, if made general, will accomplish better the object even of the militia; that the juvenile drill will abate diffidence in military efficiency, and will spread a wide pre-disposition to a better order of recruiting for the public service, will tend to the improvement of the ranks of the regular force, whether naval or military, and will produce an immensely stronger and cheaper defensive force than by the means at present in use or in public view.

And, finally, that the means of producing this defensive force, instead of being an expense will be a gain to the productive *power and value of the labor of the country.*

We have not noticed, hitherto, the influence of the new system upon the *morale* and discipline of schools. On this head there is a singular unanimity among the masters of the schools where the experiment has been tried. They all consider the drill as an invaluable help to them in enforcing the ordinary school discipline. And they ascribe the usefulness of drill in this particular to the habits of order, punctuality, of prompt, unquestioning obedience and of respect for their superiors which the boys necessarily acquire during their lessons in drill. Indeed several instances are adduced

* It is perhaps not generally known that up to the end of the fifteenth century, and even later, archery formed part of the ordinary education of the boys of England, and was practised at many public schools. The last Act by which boys were required to be taught archery was passed in 1541.
See Chadwicks explanatory letter, note, p. 42.

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by Mr. Chadwick's witnesses, where the military drill having been, from one cause or another, discontinued in a school, the spirit of insubordination became such that the unhappy master was compelled to reëstablish the drill in order to restore the discipline of the school. It would be difficult to find a better practical commentary on the moral value of the new system.

Sir Francis Bond Head gives his opinion on the moral value of drill in very characteristic and forcible language: "The dull sounding, but magic little words of command—'Eyes right!' 'Eyes left!' and 'Stand at ease!' 'Attention!' &c., instil into the minds of a lot of little boys, the elements, not of war, but of peace. Instead of making them ferocious—to use Mr. Rarey's expression—these words 'gentle' them. By learning to be subservient not to their own will, but to the will of others, they became fit in every possible department to serve their country."

Any one who will take the trouble to read the evidence submitted by Mr. Chadwick, must admit that it entirely bears out his estimate of the important results both to the individual pupil and to the nation, which may be expected to flow from the combination of the two proposed changes in the general system of public education. The witnesses may, indeed, be said to be almost unanimous in their views, and one goes so far as to say that even the author, Mr. Chadwick himself, underrates their value and importance.

That military drill can be taught to boys at school more effectively and economically than afterwards, is a proposition which few probably will be disposed to dispute. Many, however, may feel inclined to ridicule the idea of "naval drill" in inland schools. On this point one of Her Majesty's School Inspectors, Mr. Tuffnel, cites the opinion of the late Recorder of Doncaster—Dr. Hall:—

"When I first saw," wrote Dr. Hall, "the contrivance (a ship rigged with masts and ropes at a school) at Mettray, in France, I could not refrain from intimating a doubt as to its practical utility. But I found that I was quite mistaken. In France the experiment was tried at the suggestion of the Minister of the Marine himself,

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and the youths so exercised are received on board ship as sailors, not as lads. At Ruysselade the success is still more striking. In the course of last year, the second of the experiment, no fewer than sixty-four colonists (youths educated at the institution) entered the mercantile marine and the military marine, and their conduct has been so superior that the establishment is overwhelmed with applications from ship-owners."* The success of the naval drill, wherever it has been tried in English schools, has, as might have been expected, been quite as satisfactory as in France.

The gain to the productive energy of the country, resulting from the drill system, is a subject of which the importance cannot be overrated. In an opening address delivered by Mr. Chadwick before the British Association for the Advancement of Science, in 1862, he returns to this topic, and discusses it in considerable detail. In that address he shews conclusively the immensely superior efficiency of educated labor over uneducated labor, of those educated under his system over those brought up under the old routine. "On the practical testimony," he says, "of such men as the distinguished members of this association, large employers of labor, Mr. W. Fairburn and Mr. Whitworth, it is established that for all ordinary *civil* labor, four partially trained or *drilled* men are as efficient as five who are undrilled. In other words, considering the educated child as

* In the number of *The Athenæum* for December 31st, 1864, there is an interesting account of the results of the "half-time" system in the children's establishment at Limehouse in England :—

"The school is conducted on what is called 'half-time,' a system much recommended, and found to work extremely well. Mr. Moseley, the intelligent and earnest superintendent, gave it as his decided testimony, that the children come to their lesson-books brighter and fresher and give more close and efficient attention when they are on half-time. The children are in school on alternate days, half of them being in the school, and the others employed in industrial occupations. The children are not occupied more than eighteen hours in the week in close book-instruction, the other portion of their time being employed in industrial training. * * *

"The addition of physical training is a wonderful improvement in the system of education. The influence of the drill gives the boys self-respect; they become smart, active clean-limbed, adroit; they acquire the control over their own limbs. Systematized drill gives the boys, early, an initiation into the virtues of duty, order, obedience to command, self-restraint, punctuality, patience,—no small addition to the value of a man's heritage in himself! Cheerfulness and prompt obedience seemed the characteristics of the children, both boys and girls."

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an investment made by the State, for a trifling expense of about one pound per head, the productive power of that investment may, by physical training, be augmented by one-fifth for the whole period of working ability. Some distinguished authorities," he adds, "consider that he understates the gain of productive power when he put it down as one-fifth, and assert that it is practicable to give to three men by this system the working-power of five." Now, what does this mean? It means that we can, by a change of our mode of education, add as much to the productive energies of the nation as if we had added one-fifth, if not two-fifths, to the number of the working classes, and this "without the expense of educating the additional one-fifth, feeding, clothing, housing them or administering their public affairs."

We now proceed to say a very few words upon the last topic which we propose to discuss in connection with this subject, namely: the bearing of the half-time system with military drill on the question of our national defence.

From the Report of the Chief Superintendent of Education for Upper Canada for 1860, it appears that the number of boys attending the Common Schools in that part of the Province was, in round numbers, 172,000; last year the number was 190,000.

The number of boys attending the Common Schools in Lower Canada, for 1860, is not stated in the Report of the Superintendent for Lower Canada. The total number of pupils, however, is given, and assuming the proportion between boys and girls to be about the same as in Upper Canada, the number of boys attending schools that year may be put down at about 80,000. The total number of boys, therefore, in Upper and Lower Canada, attending school in 1860, would be about 250,000 or a quarter of a million. Assuming, however, one-fifth of this number to be, from physical or other causes, incapable of drill, and this is, doubtless, an over-estimate, there would still remain 200,000 boys undergoing drill in our common schools—if the system was universally carried out. At the end of ten or twelve years from the first inauguration

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of such a system in Canada we should have, probably, half a million of youths who had undergone a regular course of drill; a very large proportion of whom would be capable of bearing arms, and, should the emergency arise, could be readily converted into good and serviceable soldiers. Our common schools would thus be made the nurseries of our militia.*

It is not very long since the heart of our people was stirred at the near prospect of a struggle between the Mother Country and the States. That struggle has been for the present happily averted; but who shall say for how long? It is to be hoped that if the danger which then threatened us should hereafter actually come upon us we may not be found as hopelessly unprepared to meet it as we then were. And, assuredly, we shall not be unprepared for such an emergency, if, we shall have previously established military drill as part of the ordinary instruction given in all our public schools.

It has been wisely said by one of our ablest statesmen, referring to the recent threatened difficulties with our neighbors: "That it is the first point of patriotism with us to create an enthusiastic attachment among all orders of men for our Constitution." If this be the first point of patriotism, I should say that the second is to give all orders of men in our State the skill and ability necessary to enable them to stand forth confidently in the hour of danger in defence of their altars and their homes.

It is to be remembered, too, that within the last few years the position of Canada, both as regards the Mother Country and the States, is entirely changed. To England we had been in the habit of looking with confidence for protection from every danger, and from the States we thought there was no danger to be apprehended. Now, on the contrary, we have received warning from England that we must take measures to protect ourselves, and, at the same time, we have received warning from our neighbors that we need to do so. It is this peculiar crisis in our colonial

* Drill when thoroughly acquired in youth, would, like swimming, riding or skating, remain a permanent acquisition. So true is the maxim:

"Quo semel est imbuta recens servabit odorem testa diu."

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history which gives to the question of our national defences such paramount interest at the present moment. In the energy and zeal with which, on the recent occasion to which we have referred, men of all ranks, from one end of the Province to the other, responded to the call to enrol themselves for the defence of the country, we have an earnest and a proof of the spirit which animates the people. It will be the wisdom of our statesmen to foster and encourage this spirit of patriotism, and to turn it to the best account.

Our neighbors across the lines have not been slow to perceive that the best way of promoting the growth of patriotism and a love of military life among their citizens is by following out the Chadwick system, and making military drill part of the ordinary business of their schools. The system has in fact been in practical operation for the last two or three years in many schools and colleges in the the Union. The Governors of the States of New York and Massachusetts have, in their addresses to the State Legislatures, called attention to the subject as one of momentous importance. Educational reformers have advocated it, and measures have been introduced (if they have not been actually passed) into the Legislatures of certain States, to make military drill compulsory on all boys above ten years of age attending the schools which receive aid from the public purse. "*Fas est et ab hoste doceri.*" We have learned from our neighbors many a lesson, which had far better been left unlearned; let us learn from them, in this at least, one good and useful lesson. A senator in Massachusetts lately, giving his views on the importance of military studies in colleges, says: "Let the drill be regular and compulsory, taking the place of the very irregular and inefficient physical exercise now in vogue, and our colleges would be vastly improved in their educational form, and the commonwealth would, in a short time, have a numerous body of intelligent men, well skilled in the military science and art, who will become teachers in our lower grades of schools, and be competent, when the alarm is sounded, to lead our citizen soldiers in the field."

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In view then of the present crisis of our national history, it is satisfactory to know that in Canada some steps are being taken towards "putting our house in order." In both sections of the Province the able Superintendents of Education have, of their own accord, established military drill in a large number of the grammar and common schools throughout the country. In the *Journal of Education* for Upper Canada, many admirable articles on the subject of military drill in schools have from time to time been published. The Chief Superintendent of Education in Upper Canada, informs me, that eighteen grammar schools reported military drill as part of their course of training in 1863, and he also states, what is perhaps even more important, that during the last six months of 1863, the stu-students in the Normal School have formed themselves into a drill association, which he adds will doubtless contribute much to the general introduction of military drill into the Common Schools of Upper Canada.*

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* I have much pleasure in quoting the following extract from the Annual Report of the Chief Superintendent of Education for Upper Canada, for the year 1863, published since the date of my paper. Under the head of "Military drill in schools" the Superintendent writes:—

"The Board of Common School Trustees in the City of Toronto have, with praiseworthy intelligence and public spirit, introduced a regular system of military drill among the senior male pupils of their schools; the Board of Trustees in Port Hope have done the same. The system of military drill can be easily introduced into the schools of all the cities, towns and villages in Upper Canada, and perhaps in some of the larger rural schools; and the military training of teachers in the Normal School, together with the large number of persons who are being taught and certificated in the Government Military School, afford great facilities for making military drill a part of the instruction given in the grammar and common schools referred to.

"In the neighboring States this subject is engaging the anxious attention of the governments and legislatures; and military drill is likely to become a part of the system of education in all the public schools of their cities and towns. The Legislature of Massachusetts, at its last session, passed a resolution directing the State Board of Education 'to take into consideration the subject of introducing an organization of scholars, above the age of twelve years, for military drill and discipline.' The Board appointed a Committee (of which the governor of the State was chairman) to investigate the subject, and to enquire into the result of an experiment which has been tried for two or three years in one of the towns of the State—the town of Brookline. The result of the enquiry is thus stated—'The boys in the older class can already be selected from their playmates *by the improvement of their forms*. Habits of prompt, instant, and unconditional obedience are also more successfully inculcated by this system of instruction than by any other with which we are acquainted. A perfect knowledge of the duties of the soldier can be taught to the boys during the time of their attendance at the public schools, thus

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In connection with the movement may be mentioned the encouraging fact, that the companies which have been formed in the schools and colleges, both in Upper and Lower Canada, are amongst the most proficient in the Province, and that they have received high enconiums on several occasions from the military officers who have inspected them. This is, indeed, only what might have been anticipated. Colonel Wily, of the Adjutant General's Department (himself an experienced soldier), on whose authority the preceding statement is made, has long earnestly advocated the introduction of military drill into schools, and he cites, as a proof of the practical results of the system, the admitted superiority of the militia of the Channel Islands, particularly of the Island of Jersey, of which he is a native.*

Drilling and volunteering have, for the last two years, been the order of the day in Canada, and most men under fifty and some over that age have been initiated in the "goose-step," and learned the mysteries of "forming fours." If from our drill ex-

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obviating the necessity of this acquisition after the time of the pupil has become more valuable. A proper system of military instruction in the schools of our commonwealth would furnish us with the most perfect militia in the world; and we have little doubt that the good sense of the people will soon arrange such a system in all the schools of the State.'"

The Committee adds the following remarks, which are as applicable to Upper Canada as they are to Massachusetts:—

"The public schools are maintained at the public expense, in order to prepare youth for the duties of citizenship. One of these duties is to aid in the defence of the Government whenever and however assailed. Surely, then, there is no incongruity, no want of reason, in introducing into the schools such studies and modes of discipline as shall prepare for the discharge of this equally with the other duties which the citizen owes to the State.

"But can this be done without detriment to progress in other branches? Can it be done without loss of time? The Committee is satisfied that it can, and that thereby a large amount of practical knowledge and discipline in military affairs may be attained, and at the same time a very great saving of time and labor be effected, which, under a system of adult training, would be withdrawn from the productive industry of the country."

* Under the admirable militia organization which has for centuries obtained there, every boy, between the age of fourteen and sixteen, is compelled to attend drill once a week, commodious drill sheds, and competent drill instructors being provided for the purpose. Into the details of the admirable and most economical militia organization of the Island of Jersey it would be out of place to enter here. I may, however, observe that those who are charged with the responsible task of organizing our militia might possibly find it not unprofitable to enquire into the working of a system which has produced, at a very trifling cost, a militia probably unequalled in the world. And it will probably be found that the great secret of the success of that system lies in the early military drill of every boy upon the island.

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perience we have learned nothing more, we must have at least learned this lesson: that soldiers are not made in a day, and that to expect to make an efficient militia by drilling men, taken from the plough or from the workshop, for three or four weeks in the year is simply absurd.

An English statesman once designated the militia as *depositories of panic.* And the great Dryden describes the militia of his day in far from flattering terms, as

> "Mouths without arms, maintained at vast expense,
> In peace a charge, in war a weak defence."

If we desire to have in Canada a militia the opposite of this; a militia which will cost us little; one of which we may feel proud in peace, and upon which we may rely with confidence in time of war; a militia in a word which will recal the memories, and be ready to repeat the deeds, of our ancestors in 1812; we must see that our sons, while at school, learn thoroughly their military drill. There let us instruct them in the first rudiments of the arts of war as well as peace. There let us teach them to regard it as their pride as well as their duty to be *ready, aye ready,* to stand forth, when the need comes, to do or die for their country. There let us imbue them with that high and noble patriotism, that spirit of intelligence and self-reliance which, aided by physical health and strength, will make them good men, good citizens, and good soldiers, the ornament at once, and best defence of their country.*

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* Schools for the military instruction of candidates for commissions in the Service Militia of Canada were opened, about the date of this paper, April, 1864, in Quebec and Toronto. These schools have been most successful, and by the end of the year upwards of two hundred and fifty persons had obtained first class certificates.† In connection with these schools there are two points which the year's experience of their working has, I think, conclusively established and to which I wish to call attention in corroboration of the general arguments advanced in the present paper:—

1st. That, as a general rule, the boys have mastered the drill more easily and more thoroughly than the men.

2nd. That the six or eight weeks' tuition in the drill-shed has served, in a way quite unexpected by the parents, not only to brighten and sharpen the boys' wits, but even to make them, in many cases more docile, useful and agreeable at home.

† *Report on the state of the Militia for* 1864, p. 8.

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Paper VII.—ON TWO MUMMIES FROM THEBES, IN UPPER EGYPT.

By REV. JAMES DOUGLAS.

(*Read before the Society, 15th February, 1865.*)

When my father opened the mummy before you, in November last, he protected himself from the ridicule which follows mistakes on such occasions, by stating the many sources of error which may falsify the most careful diagnosis of the mummy. It was well that he did so, for a more thorough examination than we could make that night revealed a man and not a woman, as he judged it to be from the lid of the case.

The examination disclosed some curious particulars. It is a mummy of a youth who had hardly attained the age of manhood, and who had struggled up to that period of life through suffering and fearful physical deformity. He was only five feet in height, —had a small head and a sharp, thin face—was hump-backed—and lame, through the left leg being shorter than the right. The foot of the deformed leg is furnished with six toes. So crooked was he, that his embalmers—for the purpose of straightening him —passed a stick through the pelvis, transfixing the body. But that means failing, they bound him down to a heavy piece of wood, which they concealed among the bandages. The vertebral column is very much distorted, and the sternum lies almost upon the back bone. In order, therefore, to make the figure shapely, the embalmers stuffed a quantity of cloth between the integument and the ribs.

It was not a mummy of the first quality, nor yet of the most inferior preparation. The extremities seem to have been dipped in liquid bitumen; and bitumen appears to have been laid evenly over

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the back, but only at spots upon the front of the body. The chest is covered with almost half an inch, of what is now a fine powder, but was, when laid on fresh, a consistent gummy substance, as its composition shows. And the head and face, upon which traces of bitumen are found, are preserved with the same compound. Under the microscope this powder presents the appearance of yellow crystals of different shapes and density of color. Dr. Anderson was so kind as to analyse 30 grains of it. The result he communicates in the following memorandum:

"I digested the 30 grs. for forty-eight hours in hot alcohol at 90°; the residuum I digested for forty-eight hours more in the same way in water. On filtering there remained matter inodorous and tasteless, evidently vegetable ligneous matter, and weighing 12 grains—thus shewing that *eighteen* grains had been dissolved. The solutions, both in spirits and water, were bright and transparent, and on evaporation some salt of ammonia was carried off. I evaporated the spirituous solution to the consistence of ordinary varnish, and on applying it either to earthenware or wood, it answers as a varnish. That it is a resin and insoluble in water, is proved by dropping it into water which it at once renders milky and turbid. The watery solution is evidently vegetable mucous or gum, mixed with a certain portion of animal mucous or gelatine; the latter probably from some of the insects whose bodies were completely disintegrated."

The wood is probably cassia bark, which was largely used, and with which the whole cavity of the body is sometimes filled.

That the body had gone through the usual salting process is proved by the appearance of crystals of netron upon the brain, soon after exposure to the air. The brain had not been extracted. Upon removing the calvaria we found it lying on the occiput in a compact mass, shrivelled to about three and a half inches in its longitudinal diameter, and two inches in thickness. It retains distinctly its shape—the under part exhibiting the division between the cerebrum and cerebellum, and the upper part the division of the hemispheres and the convolutions. The dura mater adhered to the skull and retained, to a certain degree, its toughness.

The viscera were either in whole or in part mummied, wrapped up in cloth and shoved up into the chest, but their remains were undistinguishable. The abdomen was filled with cloth.

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In the abdominal cavity, beneath the skin of the chest and face, in the orbits, and within the skull were found a few specimens of *Necrobia mummiarum*, and a great many perfect specimens of the *Dermestes pollinctus*, with some *pupæ* and innumerable empty cases.

Beside the gold emblem of the soul, found at our first examination on the pit of the stomach, nothing was enveloped with the body. That emblem was often worn as a personal ornament, and was thought to act as a charm. It has the body, wings and tail of a bird, with the head of a woman. The specimen in question weighs 3 dwts. and 10grs. The wings are coated with enamel, some fragments of which had fallen out before it was buried with the dead; and it bears other signs of having been well worn by the living.

The only peculiarity in the bandaging was in the unusual quantity of padding, which the decrepid form of the body rendered necessary.

On a previous visit to Egypt my father procured at Thebes a handsome male-mummy case, with body enclosed. From its elaborate workmanship it evidently contained a person of consequence. This was corroborated by the occurrence, among the usual hieroglyphical sentences upon the cover, of the name of King Amunoph I., the second ruler of the 18th dynasty—circa 1500 B.C., and by the discovery in the tomb of a very beautifully sculptured stone tablet and a painted wooden tablet, with the names of Amunoph and his immediate successor. We concluded that the mummy was that of a servant about the court, or some public officer of trust. On being unrolled, it revealed a life the very opposite of that which the poor decrepid lad had led. It was the mummy of a strongly-built man of 5 feet 10 inches, with a fine well-balanced head. The skull tells the story of his life. The frontal bone had been seriously fractured immediately behind the frontal eminence of the right side by a blunt instrument, which had depressed the bone over the surface of a square inch. The injury had been received so long before his death as to afford

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time for all the changes which take place subsequent to fracture with great depression of the bone.

Another peculiarity illustrates his life. He was mummied when almost a skeleton. The skull clearly evinces this. Other parts of the body had been considerably injured by moisture, but the wrappings of the head were as sound as when they came from the loom. Beneath the wrappings we found spread a coat of transparent, ruby-colored gum, of about the consistence of honey, as fresh apparently as when laid on. But between this preservative layer and the bone, there does not exist a trace of integument. The bone was quite moist. The gum, on exposure to the air, soon dried, and now resembles the preservative mixture of the first mummy. Crystals of salt have since appeared upon the dry surface of the gum.

The rest of the body was in much the same state. Here and there only a little dry integument adhered to the bones. The cavity of the abdomen and chest was filled with earthy matter, and the skull contained only a few drachms of the preservative substance in fine powder. Not any trace of the lining membranes exist.

No ornament was found; but an unusual quantity of cloth was used to compensate for the deficiency of flesh.

There is no doubt that little else than the skeleton was embalmed. Coupling this with the fractured skull, we may suppose him to have been a warrior of rank and distinction who died on some foreign campaign, and whose remains were brought home in a state of decomposition to be embalmed and buried with pomp in the Theban necropolis. With whatever imaginary circumstances however we surround his death, his posthumous history was strange.

It is not often that marks of this kind occur to give an insight into the history of the mummified man. It is difficult to associate the ideas of humanity and even mortality with a mummy, until some sign of our common frailty reminds us that the mummy was once a suffering being like ourselves. Others than myself felt this

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when we came to the deformed members of the poor lad. He had been a repulsive cripple—as deformed as is almost possible to be. Yet he had retained throughout his dreary life the love of parents who, though poor, had done their best to give him decent burial, and protect him in his passage to the other world by perhaps the only costly thing they had in their possession—a well-worn heir loom. These simple circumstances form a link most intimate between that far-off past and the present, and make us feel that amidst the more external difference, whether of thought and opinion, or of outer life, there existed then as now the common human sympathies and natural impulses of the heart, which afford the best argument for the essential unity of our human race.

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Paper VIII.—THE LOST ISLAND OF ATLANTIS.

BY E. T. FLETCHER, Esq.

(*Read before the Society, 6th May,* 1863.)

The Latin historian, Lucius Annæus Florus, in describing the progress of the Roman arms in Spain, speaks of the awe with which Decimus Brutus beheld, for the first time, the sun descend into the broad Atlantic, and its fires become quenched in the illimitable western ocean. The Roman leader would perhaps have been still more impressed with the solemnity of the scene, had he thought it possible that beneath those waves there lay a buried world, that a great island with all its tenants had sunk ages ago in its depths, and that a civilization, older than the lore of Egypt or the wisdom of Etruria, had found amid these waters a cradle and a grave. He might have philosophized mournfully on the uncertain tenure of all human greatness, on the evanescence of a national splendor whose very sepulchres had perished, and on the special destiny of a commonwealth so utterly destroyed as to leave to after ages its very existence a matter of debatable inquiry.

From all time the finger of tradition has pointed to the West as the peculiar abode of a happier and more favored race. The gardens of the Hesperides, the islands of the Blest, the bourne of the Atlantides, the Western Ethiopians, the Atlantis of Plato, these are legends familiar to all. Not only has Euripides, in one of the choral songs of his Hippolytus, celebrated the happy isles where the winds blow ever softly, and the ambrosial streams flow fast by the palaces of Jove; but Pindar himself, whose birth preceded that of Herodotus by nearly a century, speaks in his second Olympiac of the island of the Blest—for with him there is but one island—fanned by ocean breezes and adorned by every blessing of fruit and flower. Thus, also, a modern poet, Tennyson, in those

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fine lines of the Morte d'Arthur, suggested possibly by a well-known passage in the fourth Odyssey, sings of

> "The island-valley of Avilion,
> Where falls not hail, or rain, or any snow,
> Nor ever wind blows loudly, but it lies
> Deep meadowed, happy, fair with orchard lawns
> And bowery hollows crowned with summer sea."

Even beyond the limits of classic story, everywhere and always, has this oldest of legends held an abiding place in the hearts and memories of all men. Still do the inhabitants of the Arran isles, on the edge of the great western main, believe that from time to time they see the shores of a happy island rise above the waves. Still, in the time of Marco Polo, a similar tradition prevailed among the Cinghalese. The sagas of the North yet speak of the island of Atle: and even the Japanese Ainos of the farthest East retain the memory of a time when there was no land but islands, and when the first of the race, after drifting long on the ocean, landed at one of these, and lived in a garden of delights for many years. Nor is this all; these western seats were claimed as the well-spring and fountain-head of intellectual culture. Doubtless much of what we call mythic fable is but symbolism or allegory, divine influences clad in anthropomorphic robes, or philosophic sequence given in the form of narrative. But sharply and clearly from the mists of mythos and legend stands forth the story of Atlantis. Its pragmatic truthfulness is evinced by the choice of Solon, who selected it as the subject of an epopee, as well as by the solemnity and earnestness with which the story is brought forward by Plato as an ancient and family heir-loom. Even so grave a writer as Strabo, is of opinion that what Plato relates of the Atlantis is no mere invention: and the priests of Sais themselves confessed that the antiquity of Egypt paled before that of the Atlantids, who invaded Egypt in arms and sowed the seeds of its earliest cultivation. Atlantis was the daughter of Atlas. But Atlas had also a daughter named Merope, whence the "meropes," or speaking men, looking on language or articulate speech as the

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sign and token of civilized humanity. Mercury himself, the god of eloquence and persuasion, appears in the theogony of old Rome as the grandson of Atlas. With Ovid he is "Atlantiades," and "Atlantis Pleionesque nepos": so also Horace, as witness his ode commencing

> Mercuri, facunde nepos Atlantis
> Qui feros cultus hominum recentum
> Voce formasti catus;—

Compare also in this connection λόγος with λέγω. "In the beginning was the Word." Thus also Dante, "non ragionam di lor," and Hamlet speaks of the "brute that wants discourse of reason." Circe appears in the Odyssey as δεινη θεος, a sacred divinity, but with the special attribute αὐδήεσσα, or gifted with articulate speech. Our word "dumb" is the analogue of the Teutonic "dumm," which signifies witless: and in the same spirit the Sclaves superciliously denote their German neighbours by a term signifying "voiceless," or without words. A similar meaning is attached to the Greek νήπιος, whose analysis presents the same results. Later writers place the Meropes on the Nile, but the old home of the Atlantids was the Atlas Range in Western Africa. Even in Pliny's time they had not advanced farther eastward than Libya.

The story of Atlantis appears, in the Timæus of Plato, in the following shape:—

> Listen now then, Socrates, to a story very strange indeed, yet in every respect true, as it was once related, by Solon, the wisest of the seven sages. He was the kinsman and intimate friend of our great grandfather Dropides as he himself often tells us in his poems: and he informed our grandfather Critias, as the old man himself in turn told us, that this state (Athens) had formerly achieved great and admirable actions, the knowledge of which had nevertheless been lost through lapse of time and the decay of mankind—one act in particular being more illustrious than the rest—in remembrance of which it were fitting that we should not only return you thanks, but also in full assembly hymn forth to the goddess our true and just acclaim of praise. * * * *
>
> I will acquaint you with that ancient story which I indeed received from no mere youth; for at that time Critias, as he himself said, was almost ninety years old, and I myself about ten.
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> * * * * * * * * *

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In Egypt, said he, in the Delta, about the summit of which the streams of the Nile are divided, is the district (νομός) surnamed Saitic; the chief city of which is Sais, whence also came the king Amasis; and it had a presiding divinity, whose name is in the Egyptian tongue Neith, which they say corresponds with the Greek Athena; and the people profess to be great friends of the Athenians, and united with them in a sort of close alliance. Solon said that on his arrival thither, he was very honorably received, and especially, on his inquiring about ancient affairs of those priests who possessed superior knowledge in such matters, he perceived that neither himself nor any one of the Greeks (so to speak) had any antiquarian knowledge at all. And once on a time desirous of inducing them to narrate their ancient stories, he undertook to describe those events which had formerly happened among us in days of yore—those about the first Phoroneus and Niobe; and again after the deluge of Deucalion and Pyrrha, how they survived together with their posterity, paying due attention to the different ages in which these events are said to have occurred: —on which one of their extremely ancient priests exclaimed. "Solon, you Greeks are always children, and aged Greek there is none." * * * You are all youths in intelligence; for you hold no ancient opinions derived from remote tradition, nor any system of discipline that can boast of a hoary old age: and the cause of this, is the multitude and variety of destructions that have been and will be undergone by the human race, the greater indeed arising from fire and water, others of less importance from ten thousand other contingencies. * * * * The truth is, however, that in all places where there is neither intense cold nor immoderate heat, the race of man is always found to exist, sometimes in less, sometimes in greater number. And all the noble, great or otherwise distinguished achievements, performed either by ourselves, or by you, or elsewhere, of which we have heard the report—all these have been engraven in our temples in very remote times, and preserved to the present day; while on the contrary, with you and all other nations, they are only just committed to writing, and all other modes of transmission which states require—when again, at the usual period, a current from heaven rushes on them like a pestilence, and leaves the survivors among you both destitute of literary attainments and unacquainted with music;—and thus you become young again, as at first, knowing nothing of the events of ancient times, either in our country or yours. As to the things, Solon, which you have just related from your antiquities, they differ indeed but little from puerile fables—for in the first place you mention only one deluge of the earth, whereas there had been many before; and in the next place you are unacquainted with that most noble and excellent race of men who once inhabited your country, from whom you and your whole present state are descended, though only a small remnant of this admirable people is now remaining—your ignorance in this matter resulting from the fact that their posterity for many generations died without speaking to posterity by writing; for long before the chief deluge, a city of Athenians existed, regulated by the best laws, both in military and all other matters, whose, noble deeds and civil institutions are said to have been the most excellent of all that we have heard to exist under heaven.

* * * * * * * *

Many and mighty deeds of your state, then, are here recorded in writing (in our sacred records), and call forth our admiration; nevertheless there

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is one in particular, which in magnitude and valour surpasses them all; for these writings relate what a prodigious force your city once overcame, when a mighty warlike power, rushing from the Atlantic sea, spread itself with hostile fury over all Europe and Asia. That sea indeed was then navigable, and had an island fronting that mouth which you in your tongue call the pillars of Hercules; and this island was larger than Libya and Asia put together; and there was a passage hence for travellers of that day to the rest of the islands, as well as from those islands to the whole opposite continent which surrounds that, the real sea. For as respects what is within the mouth here mentioned, it appears to be a bay with a kind of narrow entrance; and that sea is indeed a true sea, and the land that entirely surrounds it may truly and most correctly be called a continent. In this Atlantic island, then, was formed a powerful league of kings, who subdued the entire island, together with many others, and parts also of the continent; besides which they subjected to their rule the inland parts of Lybia, as far as Egypt, and Europe also, as far as Tyrrhenia. The whole of this force, then, being collected in a powerful league, undertook at one blow to enslave both your country and ours, and all the land besides that lies within the mouth. This was the period, Solon, when the power of your state was universally celebrated for its virtue and strength;—for, surpassing all others both in magnanimity and military skill, sometimes taking the lead of the Greek nation, at others, left to itself by the defection of the rest, and brought into the most extreme danger, it still prevailed, raised the trophy over its assailants, kept from slavery those not as yet enslaved, ensured likewise the most ample liberty for all of us without exception who dwell within the pillars of Hercules. Subsequently, however, through violent earthquakes and deluges which brought desolation in a single day and night, the whole of your warlike race was at once merged under the earth; and the Atlantic island itself was plunged beneath the sea, and entirely disappeared;—whence even now that sea is neither navigable nor to be traced out, being blocked up by the great depth of mud which the subsiding island produced.

The above, O Socrates, is the sum of what the elder Critias repeated from the narration of Solon.

Thus far the Timæus. In the Critias, Plato enters upon a more minute description of the island. The speaker here is a Greek: in the Timæus it was an Egyptian. It is Critias himself who thus discourses:

* * * * *

First of all, then, let us recollect that it is about nine thousand years since war was proclaimed between those dwelling outside the pillars of Hercules and all those within them—which war we must now describe. Of the latter party then, this city was the leader and conducted the whole war; and of the former the kings of the Atlantic island, which we said was once larger than Libya and Asia, but now, sunk by earthquakes, a mass of impervious mud, which hinders all those sailing on the vast sea from effecting a passage hither:

* * * * *

As we remarked at first concerning the allotment of the gods, that they

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distributed the whole earth here into larger, and there into smaller portions, procuring for themselves temples and public sacrifices—so Poseidon in particular, taking as his lot the Atlantic island, begat children by a mortal woman, and settled in some such spot of the island, as we are about to describe. Towards the sea, but in the centre of the whole island, was a plain, which is said to have been the fairest of all plains, and distinguished for the excellence of its soil. Near this plain, and at its centre, about fifty stadia distant, was a mountain with short acclivities. On this, dwelt one of these men who in primitive times sprang from the earth, by name Evenor, who lived with a wife, Leucippe; and they had an only daughter, Clito. Now, when this girl arrived at marriageable age, and her father and mother were dead, Poseidon becoming enamoured made her his mistress and circularly enclosed the hill on which she dwelt, forming the sea and land into alternate zones, greater and less, turning as it were two out of land and three out of sea, from the centre of the island, all equally distant, so as to be inaccessible to men; for at that time ships and navigation were not known. And he himself with his divine power agreeably adorned the centre of the island, causing two fountains of water to shoot upwards from beneath the earth, one cold and the other hot, and making every variety of food to spring abundantly from the earth. He also begat and brought up five twin male children; and after distributing all the Atlantic island into ten parts, he bestowed on the first-born of the eldest pair his mother's dwelling and the allotment about it—this being the largest and best; and he appointed him king of all the rest, making the others governors, and giving to each the dominion over many people and an extensive territory. He likewise gave all of them names—to the eldest, who was the king, the name of Atlas, from whom, as the first sovereign, both the island and sea were termed Atlantic; and to the twin born after him, who had received for his share the extreme parts of the island towards the pillars of Hercules, as far as the region which now in that country is called Gadeirica, he gave the name which in Greek is called Eumelus, but in the language of that country Gadeirus.

* * * * * *

All these then and their descendants dwelt for many generations, as rulers in the sea of islands, and as we before said, yet further extended their empire to all the country as far as Egypt and Tyrrhenia. By far the most distinguished however was the race of Atlas; and among these the oldest king in succession, always handed down the power to his eldest son.

* * * * * *

Many possessions indeed accrued to them, through their power, from foreign countries; but the greatest part of what they stood in need was provided for them by the island itself—first, such ores as are dug out of mines in a solid state, or require smelting;—and especially that metal 'orichalcum' which is now known only by name, but formerly of high celebrity, was dug out of the earth in many parts of the island, being considered the most valuable of all the metals then known, except gold: and it produced an abundance of wood for builders, and furnished food also for tame and wild animals. Moreover, there were comprised within it vast numbers of elephants:—for there were abundant means of support for all animals that feed in marshes and lakes, on mountains and plains, and so likewise for this animal, which by nature is the largest and most

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voracious of all. Besides these, whatever odorous plants the earth now bears, whether roots or grass, or woods or distilling gums, or flowers or fruits—these it bore and produced them to perfection. And yet, further it bore cultivated fruits, and dry edible fruits such as we use for food;—all these kinds of food we call vegetables—together with all that trees bear, as drinks, meats, and ointments; and those also, whose fruits, such as acorns, being used in sport and pleasure, are with difficulty hoarded up, together with certain dainty fruits for dessert that might provoke the satiated palate, or please the sick;—all these that once existing and warmly acclimated island bore, sacred, beautiful, wonderful, and infinite in quantity. Receiving all these, then, from the earth, the inhabitants employed themselves also in erecting temples, royal habitations, ports and docks over the whole region.

* * * * * *

The temple of Poseidon himself was a stadium in length, three plethra in breadth, and of a height to correspond, having something of a barbaric appearance. All the outside of the temple, except the pinnacles, they lined with silver, but the pinnacles with gold:—and as to the interior, the roof was formed wholly of ivory variegated with gold and orichalcum. They also placed in it golden statues, the god himself being represented as standing on a chariot holding the reins of six winged horses, of such a size as to touch the roof with his head. and round him a hundred nereids on dolphins; * * and it contained also many other statues dedicated to private individuals. Round the outside of the temple likewise golden images were placed of all the men and women that were descended from the ten kings, and many other large statues, both of kings and private people, both from the city itself, and the foreign countries over which they had dominion. There was an altar too, of corresponding size and workmanship with these ornaments; and the excellence of the palace was proportioned to the magnitude of the government and also to the order observed in the sacred ceremonies.

Next, they used fountains both from the cold and hot springs, of which there was a great abundance, either of which was wonderfully well adapted for use from its sweetness and excellence; and round them they fixed their habitations and excellently watered plantations, together with their water tanks, some open to the heaven, but other for winter use roofed over for warm baths.

* * * * * *

On crossing the three exterior harbours, one was met by a wall which went completely round, * * and enclosed in one the entrance to the canal and the entrance to the sea. The whole of this part indeed was covered with many and densely-crowded dwellings;—and the canal and largest harbour were full of vessels and merchants coming from all parts, causing from their multitude all kinds of shouting, tumult, and din all day long and the night through.

* * * * * *

The whole region was said to be exceedingly lofty and precipitous towards the sea; and the plain about the city, which encircles it, is itself surrounded by mountains sloping down to the sea, being level and smooth, all much extended, three thousand stadia in one direction, and the central part from the sea above two thousand. And this district of the whole island was turned towards the South: * * The mountains around it too

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were at that time celebrated, as exceeding in number, size and beauty all those of the present time—having in them many hamlets enriched with villages, as well as rivers, lakes and marshes, furnishing ample supplies of food for all cattle both tame and wild, with timber of various descriptions, and in abundant quantity for every individual purpose. The plain then being thus by nature, was improved as follows by many kings in a long course of time. It was of square shape mostly straight and oblong; and where it ended, they bounded it by a trench dug round it, the depth, breadth and length of which, for a work of man's making, besides the other connected undertakings, we can scarcely believe, though still we must report that we heard. It was excavated to the depth of a plethrum, and the breadth was a stadium in every part, the whole excavation round the plain being ten thousand stadia in length. This receiving the streams coming down from the mountains, and conducted all round the plain, approached the city in some parts and in this way was allowed to flow out to the bay. From above, likewise, straight canals were cut about a hundred feet broad along the plain, back into the ditch near the sea, distant from another about one hundred stadia:—and it was by this that they brought down the timber from the mountains to the city, and carried on the rest of their shipping traffic, cutting transverse canals of communication into each other and towards the city. Their harvest also they gathered twice in the year; in winter availing themselves of the rains, and in summer introducing on the land the streams from the trenches.

As to the quantity of land, it was ordered, that of the men on the plain fit for service, each individual leader should have his allotment, each allotment amounting in extent to a hundred stadia, and the total of the lots being sixty thousand; and of those from the mountains and the rest of the country there was said to be an incalculable number of men, to all of whom, according to their dwelling and villages, were assigned certain lots by their respective leaders. To each leader, likewise, the task was appointed of furnishing for war the sixth portion of a war chariot (to make up a total of ten thousand), two riding horses, and a two-horse car without a driver's seat, having a mounted charioteer to direct the horses, with another to dismount and fight at the side—also two heavy-armed soldiers, two archers, two slingers, three each of light-armed men, stone-shooters, and javelin-men, with four sailors to make up a complement of one thousand two hundred ships. Thus were the military affairs of this city arranged. And as respects the nine others, there were different other arrangements, which it would be tedious to narrate.

And as respects official situations and honors, the following were the arrangements made from the commencement:—Of the ten kings, each individually in his own district and over his own city ruled supreme over the people and the laws, constraining and punishing whomsoever he pleased: and the government and commonwealth in each was regulated by the injunctions of Poseidon, as the law handed them down: and inscriptions were made by the first kings on a column of orichalcum, which was deposited in the centre of the island in the temple of Poseidon, where they assembled every fifth year (which they afterwards changed to every sixth year), taking an equal part both for the entire state and its supernumeraries; and thus collected they consulted concerning the common weal and inquired what trangressions each had committed, judging them accordingly.

* * * *

Such then and so great being the power at that time in these places,

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the Deity transferred it these regions, as report goes, on the following pretexts:—For many generations, as long as the natural power of the god sufficed them, they remained obedient to the laws and kindly affected towards the divine nature to which they were allied.

* * * * * *

But when the divine portion within them became extinct through much and frequent admixture of the mortal nature, and the manners of men began to hold sway, then through inability to bear present events, they began to exhibit unbecoming conduct and to the intelligent beholder appeared base, destroying the fairest among their most valuable possessions. * * Zeus, however, the god of gods, who rules according to the laws, and is able to see into such things, perceiving an honorable race in a condition of wretchedness, and wishing to inflict punishment on them that they might become more diligent in the practice of temperance, collected all the gods into their own most ancient habitation, which indeed being situate in the centre of the whole world beholds all things * * and having assembled them, he said, * * * .

Thus abruptly ends the Critias. If completed, the termination has been lost. The extracts from this dialogue and from the Timæus will sufficiently show the form which the mythus had then assumed.*

Such is the narrative which has served as a text for the learned labours of Bailly, Rudbeck, Kircher, Beckman, Buffon, Whitehurst and others. It might seem superfluous to revive the discussion of this *vexata quæstio*, already handled by writers of acknowledged eminence. But the ever-widening circle of human knowledge permits to all to supplement, or illustrate, however imperfectly, the speculations of those who have gone before; and the recent investigations in relation to the Basques and their language, the deep-sea soundings of the Atlantic, and the amber-fauna of central Europe, seemed to present in this connection some points of interest worthy of consideration.

The island of which Plato discoursed and Pindar sang, has indeed, long since passed away, and its memory has become enshrouded in the mists of poetry and fable. The very echoes of its story have well nigh died into silence. Scarcely can we realize the remoteness of its existence. The scale of our own chronology shrinks to a point; and the effort to scan with any certainty the secrets of that

* In these extracts the translation of Davis, based on the text of Stallbaum, has been generally followed. Compare also Diodor, Sic. iii. 207, and Amm. Marcell. i. 17.

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abyss of time seems, in its futile presumption, alike profitless and vain.

Yet, if traces are anywhere left of the sacred isle and its tenants, it would appear reasonable to expect them on the borders of the North Atlantic, on the edge of that sea of marvels and mysteries (still called by the Arabs "the sea of darkness"), whose surges once broke upon their shores.

There yet remains, on the Eastern strand of the Atlantic, a people isolated from all others, standing ethnologically alone, and having no affinity with the existing families of nations; strange and solitary as some old-world denizen of the Saurian age that had lived on through many geological cycles, outliving its fellows and congeners, to confront at last the widely dissimilar types of contemporary being. Such is the Euskarian people, the Escaldunac or Basques, the lineal descendants of the ancient Iberians, who, in their turn, standing similarly apart from the rest of Europe, and possessing a literature which was already old in the days of Strabo, seem to represent some more ancient stock, whose existence stretches far back into the grey dawn of time.

The ethnologic isolation of the Basques rests mainly on linguistic grounds. Their language, the Euskara, differs widely from all others both in structure and vocabulary. Attempts have been made to connect it with the Hungarian or Madjari, with the less conspicuous Ugrian dialects of the Baltic, with the agglutinative tongues of central Asia, and even with the surrounding romance languages or daughters of the old Latin, but alike in vain. Like the mutable genie of the Arab tale, it eludes at every turn the grasp that would retain it. It remains an unsolvable enigma, a perpetual puzzle, a *pièce de résistance* for laborious continental professors. Elsewhere and with other tongues there is influence and interchange, connection and derivation; this one alone rises unconformably amidst them all like the product of an earlier formation or the mountain-peak of a drowned world.

There are many things which suggest its great antiquity as a language. The pronouns, which elsewhere are for the most part

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irregular in declension, are here regular throughout. In all that great family of languages which has been called the Indo-European, as comprising the European congeners of the Sanscrit, the pronominal inflections have a broken and disjointed aspect, as if made up of the fragments of earlier and dissimilar forms. Thus the classical *ego* is as different from the genitive *mei* as is the Russo-Sclavonic *ja* from its possessive *menja*. Something of an analogy is presented to the conglomerates and breccias of the geologist, the cemented gravels and shell-mosaics, made up of portions of older rocks. Again, the peculiar phonesis of the Euskara points to a remote era; its mute consonants being hard and pure, unlike the aspirate and sibilant phonesis of later growths. It delights in K, T, and P sounds, and in its vocalization the pure sounds A, I, and U, are largely predominant. Farther, as might be expected in a language that has come down to us from primeval times, the few lexical affinities which can be traced are shared among widely dissimilar tongues now lying far apart on the earth's surface. A few of its words are Coptic. Rask saw a likeness to the Finnish. William von Humboldt traced a resemblance to Attic Greek. Old in years, its vitality, as well as the extent of its original area, must have been great, to enable it to resist influences which would have been fatal to a dialect less old, less widely spoken, or less firmly implanted. During the entire middle ages it was never a written language. Less deeply rooted, it would have disappeared altogether. Receding everywhere, it still lives. Within the last thirty years it has lost eight leagues of territory in Spanish Navarre alone. Yet it still endures, an ancient oak with little but the stem remaining. The old forms are still preserved. Among these are some which seem analogous to those of Eastern lands, to the Kharma-dharaya compounds of the Sanscrit, where two words, a noun and its attribute for instance, are so closely united that the latter only is subject to change or inflection, the former remaining in its crude form, and both together being fused into one inseparable compound. In the Sanscrit, this fusing together of words is carried to a startling extent, particularly in the class of descriptives or epithetics known as Ba-

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huvrihi compounds. Thus in speaking of a certain river an epithet is applied to it consisting of one compound word, which word signifies, "Whose waters were sanctified by the bathing of the daughter of Janaka."

Again, the Euskarian radices or roots themselves are of a confessedly antique type:—monosyllabic, aërial, untranslateable in themselves, fulfilling no specific grammatical function, but conveying the central abstract idea, whence, as from a vitalizing germ, radiate the forms of all inflectional and conjugational bases. It is scarce necessary to revert to the fact that all language has three determinate stages: first, the monosyllabic, represented by the Chinese, where, as Bunsen has expressed it, "every word is a magnetised mineral, forming itself without any outward change into polarity (the nominal and the verbal pole), and thus having for its centre, as the indifferential point between the two, the adjective participle quality. Position assisted by accent elicits the polarity required or reduces the word to its indifferential point. The Chinese expresses 'daylight' by two words signifying in exactly the same order dây-light: but he cannot condescend to subordinate the second to the first by saying, with one accent, dáylight. If he could, the spell of monosyllabism would be broken." The slowness of mutation here approaches that of the great cosmical changes of the universe. It is only after a literature of four thousand years, that some of these unchangeable Chinese roots are beginning to be used as signs of grammatical relations. In the second or agglutinative stage something of a chrystallization has taken place among these isolated centres of thought, and polysyllabic words have been formed, the tone-syllable constituting the axis, as it were, around which the others are built up, thus forming one organism out of many syllables. In the final or inflectional stage, comprising the Semitic and Aryan groups, the material and formative parts of a word are fused together so intimately as to be not always distinguishable. Speaking in general terms, the second division may be said to be represented by the great Turanian family of languages, holding the main land of the great Asiatic conti-

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nent; while the peninsulas of Europe and India are Aryan, and that of Arabia is Semitic. The first or isolating class, with its many centres of life, and its polype like diffused vitality, may be not inaptly compared to the radiate division of the animal world, while the Articulata may afford an analogue to the Turanian class, where syllable is agglutinated to syllable by an almost vegetative process of development.

At the head of the sporadic Turanian dialects of Europe has been provisionally placed the Euskarian or Basque. But the Turanianism of the Basque differs widely from that of its supposed nearest congeners, the Finnish and Hungarian. These latter have a peculiar euphonic system, in virtue of which hard and soft vowels cannot stand together in the same word; and when a vocalized affix is added to a stem-word having a vowel or vowels of an opposite class, a species of "umlaut" takes place, and the vowel of the affix is conformed to the vocalization of the stem-word. The same principle appears abundantly elsewhere, as, *e.g.*, in the plural of Icelandic verbs and nouns, and throughout the Maeso-Gothic of Ulphilas. Nothing of this kind is to be found in the Basque, either in the modern improvisations of the Escaldunac peasant, or in those venerable war-songs which, bridging the gulf of many centuries, relate the struggles of their ancestors, the "indomiti Cantabri" of Horace, with the armed legionaries of Rome.

Nor is it altogether unworthy of observation, that there is, in the character of the Basque literature, that which hints at the effete civilization of a most ancient people. Literatures, like men, grow old. Old in an irrepressible sadness, in something of bitterness and sarcasm, in that keen appreciation of men and things which is derived from commerce, from crowded intercourse, from long experience alone. The oldest utterance is lyrical: and from the Vedaic hymns to the sententiousness of wordly-wise proverbs is a transition from infancy to declining years. To revert from the contortions and rose-tinted sentimentalism which stamp the anility of a people to the Heimskringla or the fresh sagas of the North, is to exchange the unwholesome air of a theatre for the clear beauty

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of the morning. Even below the throbbing life-pulse and muscular vitality of Homer himself we detect a despondency not unnatural in one who, receiving the last echoes of Lydian song, and wielding a language already perfect with the growth of centuries, may be said to stand at the close of a cycle rather than at the beginning. Such in its main attributes is the literature of the Basques. Such in particular is that of the Labourdan branch, as collected by Francisque Michel: sententious, artistic, sombre in tone, and rich in proverbs and apothegms of a most shrewd and practical wisdom.

Whence then did this people originate? Thus old, thus different from all others, and cut off on the East by an impassable chasm of unrelated dialects, whence did they come, or by what path did they reach their present home? May we believe that they came from the West, from some insular tract in the North Atlantic? Were there at first two opposing centres of civilization? And was the shock of their meeting dimly shadowed forth in the story of the Timæus; and commemorated by the panathenaic procession, wherein the peplus of the goddess depicted the defeat of the Titans, and the people returned thanks for their preservation from Western invaders? The Saturnian dynasty opposed to that of Jove, the war of the giants and the gods, Odin destroying Ymer and his offspring, have these a historic basis? Were it in our power to look back from some Pisgah-height on the long march of those who have preceded us, we might perhaps see how successive races, as waves of the sea, have swept over and renewed the face of the civilized world. Could our vision penetrate the mists of the morning, we might see how progress has alternated with retrogression, and how each ebbing wave has left the depopulated earth to return to the silence and desolation of its primeval forests. For decay is rapid as growth, and the traces of civilization are soon lost when the foot of the civilizer is withdrawn. It was thus that in Italy during the days of Belisarius and Narses, in France under the early Valois, and in Belgium—after the return of the Spanish provinces to the sway of the second Philip, the farms and orchards and palatial buildings, the busy roadways and all signs and tokens of content

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and prosperity, disappeared altogether, in many districts, to be replaced by the dank vegetation of fen and forest, where the bittern brooded and the wild beast made his lair.

Do these various mythi, then, all converging to one point, receive additional confirmation from other and independent sources? Are there physical grounds to corroborate Strabo's opinion that the Island of Atlantis had an actual existence, and that the narrative of Plato is not all a dream?

Let us advert for a moment to the fossil flora of the brown coal formation of Germany, and the Molasse of Switzerland, both tertiary formations belonging to the Miocene age, as investigated by Professor Unger of Vienna.

The professor remarks on the amazing number of analogues which these fossils present to those of the flora of the Northern States of America, and shews that many of these strikingly resemble the trees and shrubs of the cis-Atlantic continent. Thus the magnificent North-American Tulip-tree, the "Liriodendron tulipiferum" of Linnæus, finds a representative in the Swiss Molasse, as also in Iceland, where both the leaves and fruit of the Liriodendron of Unger have been discovered. So the fruits and seeds of "Pavia" and "Robinia," found here and there in the brown coal, shew that these genera, now limited in America to a very inconsiderable area, formerly lived and flourished in Europe, where they are now looked on as exotics and, being introduced as such into gardens, are again naturalized in their primal home. Again, the nut is notoriously wanting in Europe: for the almost naturalized wall-nut is from the forest ridges of the Southern Caucasus: but the nut-fruit is found most abundantly in the brown-coal, and if these specimens be compared with the numerous American species, the resemblance will be found most striking, in particular if the so-called grey nut of America, the "Juglans cinerea" of Linnæus, be compared with the fossil "Juglans tephrodes" of Unger, it will be found difficult if not impossible to detect any difference.

It is remarkable too that while this connection exists with the

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flora of the Western world, the plants of the neighboring Eastern continent are very sparingly represented in Europe.

Besides the instances of close remembrance already given, the professor has appended a lengthy list of other analogues, from which the following are extracted :—

In the European tertiaries, the fossil Nyssa Ornithobroma agrees with the American Nyssa aquatica.

The Taxodium dubium, with the Taxodium distichum ;

The Platanus aceroides, with the Platanus occidentalis ;

The Ostrya Atlantidis, with the Ostrya Virginica ;

The Acer trilobatum, with the Acer rubrum and the Acer dasycarpum ;

The Cercis radobojana, with the Cercis Canadensis ;

The Laurus primigenia, with the Laurus Canariensis ;

The Rhododendron megiston (Ung.), with the Rhododendron maximum (Lin.);

The Bumelia plejadum, with the Bumelia tenax ;

The genus Quercus presents no less than eight fossil species, the Tephrodes, Chlorophylla, Elaena, Myrtilloides, Apollinis, Drymeia, Lonchitis, and Daphnes, which answer respectively to the species Cinerea, Virens, Oleoides, Myrtifolia, Laurifolia, Xalapensis, Lancifolia, and Aquatica of the American continent. In the same way the fossil prunus has two species, the ilex two, the rhus three, and the pinus fourteen, all possessing exact analogues in Northern America.

Farther, Professor Heer's examination of the fossil plants of the island of Madeira, shew the following parallelism with the fossils of the European tertiaries ;

In the tertiary Flora of Europe.	Atlantic Flora of Madeira.
Woodwardia Rossneriana,	Woodwardia radicans,
Pteris Göpperti,	Pteris arguta,
Aspidium elongatum,	Aspidium affine,
Cheilanthes Laharpii,	Chilanthes fragrans,
Myrica Salicina,	Myrica Faya (Linn),
Persea Braunii,	Persea Indica,
Laurus princeps,	Laurus Canariensis,
Clethra Teutonica,	Clethra alnifolia,
Olea Osiris,	Olea excelsa,
Salix varians,	Salix Canariensis.

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Thus an interesting link of connection is supplied to the two great floras first considered.

On looking at the permanent character of the North American vegetation which seems to have changed but little since the Molasse period, whereas that of the Brown-coal has a character of exoticism and isolation, Professor Unger is led to the opinion that the "Bildung-centrum" the creative centre of the latter is the Southern part of the North American free States.

From this centre has America distributed to Europe its descendant Robinia, its Amber and Tulip-trees, its nuts, its maples, and so forth. As to the mode of transmission there are but two cases possible. Either the winged and wingless seeds and scions have been transported through the air, or by the ocean, to the Western shores of Europe, or a bridge of connection then existed which has been since destroyed. As to the air-travelling seeds, it is well known that these, either from their winged type or by the intervention of birds, frequently attain a considerable range of dispersion, but in no case a distance equal to the breadth of the Atlantic. Travelling by water, it has been no uncommon thing for plants to migrate from one continent to another. There are cosmopolites which the gulf-stream has brought from the coast of Mexico to Norway. It is to the ocean that the cocoa-nut palm owes its great range of extension. Not only does it travel well, but when thrown upon shoal or rock, if it find only a little poor white sand, which would support nothing else, the cocoa-nut contents itself there, finds brackish water not a jot less agreeable than the freshest, germinates, thrives, grows into a robust cocoa-tree. A tree being thus planted, fresh water comes, falling leaves create earth, other trees follow, and at length we see the noble palm-grove, which arrests the vapors: these eventually form a rivulet or river, which flowing from the centre of the isle make an opening of fresh water in the cincture of white sand, and thus keep the polypes, inhabitants only of salt water, at a respectful distance.* Thus an island has grown up amid the ocean.

* Michelet "La Mer."

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But in reference to these modes of transmission it may be observed that the plants so diffused are few in number, and the range of operation is for the most part limited. In fact how little the sea is adapted for a medium of transportation, has been shown by the researches of Darwin, Berkley, Salter, and Alphonse de Candolle. According to the latter, of ninety-eight species which were submitted to the experiment, only nineteen retained the faculty of germination after a six weeks' immersion in sea-water, and after being immersed for three months, all with the exception of seven had either sunk, and so become incapable of further migration or had lost the power of reproduction. But the richness and variety of the Brown-coal and Molasse-flora are adverse to the supposition of any such mode of migration as those above indicated. In that insular period when Europe itself existed only as a group of islands, the outlines of the water-basins and arms of the sea being indicated pretty accurately by the configuration of the brown-coal deposits, and when the Eastern coast of the North American States, judging from the deep-sea soundings, and the wearing effect of the gulf-stream, extended in all probability much farther eastward into the Atlantic; if we look at the peculiar vegetation of Madeira, and bear in mind the fossil plants of Iceland, which though now bare and treeless, was then thickly wooded with a flora analogous to that of the brown-coal, we cannot doubt that some vast insular tract existed at this time in the North Atlantic, extending probably from Iceland in the North to Madeira in the South, and forming a bridge of connection between the two worlds.

At a meeting of German Naturalists at Kœnigsberg, in 1861, a lecture was delivered by Director Lœw, on the Diptera of the Amber-fauna. In this fauna the perfect preservation of even the smaller and more delicate animal organisms allows of a minute comparison with their existing analogues. After shewing their agreement with various North American species, and expressing a decided opinion that the existing intercourse between the two continents is not sufficient to account for the large number of

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species common to both, the Director concludes,—" The European and the American Dipterous-faunæ always appear to me like two branches of the same stock, each having had a development of its own, very similar, however, to the development of the other. But if there really was such a common stock for both, it is to be sought among the Diptera of a former geological period, and if the European and the North American Dipterous-faunæ are to be considered as branches of this stock, the necessary inference would be that at a former period Europe and America had a continental connection.

" Are the Amber-Diptera preserved fragments of this common stock? Did a continental connection between Europe and America really exist at the time when they lived? Did the submersion of an Atlantis tear asunder the branches of this stock? Was this catastrophe accompanied by changes which modified the general laws of development of the common stock in such a manner as to produce a difference between the further development of the stronger American branch, and of the weaker European one, a difference not excluding at the same time a great deal of analogy?"

It is possible that, when investigations now going on are completed, a still stronger argument may be drawn from the European and American Hymenoptera, a family less capable of dispersion or migration, and to which the sea would be an almost insuperable barrier.

The operations of Dr. Maury, in the North Atlantic Ocean, afford a remarkable confirmation of the hypothesis adduced. His deep-sea soundings shew that a raised tract, suggestive of a submerged island, which he calls the middle ground, lies midway in the Atlantic basin, extending from the latitude of Cuba to beyond Newfoundland, and having a breadth of from twenty to thirty degrees of longitude. The soundings on this plateau, which is of clay and sand, are from one thousand to eighteen hundred fathoms. All round, immediately beyond its outline, the sea goes plumb down another thousand fathoms, and beyond this lower terrace

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there is another descent, where the Atlantic attains its greatest depth of about five thousand fathoms.

Neither is it necessary, if the existence of such an island be conceded, that the age of the human race be carried back to the period of the miocene. The island, possibly, did not sink beneath the waters before the close of the pleistocene or drift period. The various terraces round the highest level plainly point to an area of subsidence. There were sinkings at distant intervals, with long ages of rest between. It was not probably till the end of the pleiocene, that the island was reduced to its most limited extent, and subsequently became the abode of man. The old legends, retained by Plato, speak of terrible convulsions of nature, amid which Atlantis sank: can we suppose these narratives to retain a far distant echo of the throes and disturbances which preceded the modern geologic period? Without doubt, if we review in thought the many ages that must have rolled away since the period of the pleistocene, it may appear startling to conceive of man as then existing; and to compute the duration of our species on earth by thousands of centuries instead of the few thousand years usually assigned to it; but there are many considerations which would incline to the belief that the antiquity of our race has been greatly underrated. The whole tendency of contemporary scientific inquiry sets in that direction: and year by year, as book after book appears, and discovery after discovery is made, the genesis of man recedes, and the date of his appearance seems farther and farther withdrawn.

Worthy of note, too, is the great number of recorded changes and convulsions of the earth's surface, too numerous and too considerable to be comprised within the received historic period. Nor are these given as mere myths by authors little deserving of credit, but as historic events handed down by tradition and placed on record by writers not wholly devoid of critical acumen, as Strabo, Herodotus and others. Strong and indelible must have been the memory of the disturbances, wherein the agencies of water-floods, earthquakes, and subterraneous upheaving seem to have been alter-

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nately employed. It has been the parent of many myths, wherein superhuman beings have been represented in deadly warfare. The Samothracian priests had a tradition that the Pontus was originally a closed crater, and that afterwards, overflowing, it formed the Hellespont as its outlet, and separated Europe from Africa. That these two were at first one continent seems supported by the great similarity of the floras on the northern and southern shores of the Mediterranean. Crete is said to have formerly been part of the mainland, and in no other way does it seem possible to account for the presence on its mountain peaks of the Capra Sinaica, whose special habitat is between Sinai and Nubia. The island of Rhodes arose from the sea, and was subsequently inundated. Cos and Nisyrus, originally one, were rent asunder and formed two islands. The valleys of the Thessalian Peneus, and the Laconian Eurotas were dried up. Cyprus, Eubœa, and Sicily, were violently separated from the main land. Mountain tops were cast down, as that of Taygetus. Earthquakes overthrew cities, as Sparta and Sicyon, or covered them with the waves, as the Bœotian Arne and Midea, and the Achaian Helice and Bura. Islands were torn asunder, as Therasia and Thera, or wholly submerged, as Chryse, near Lemnos. Capes, as Atalanta, were changed into islands, while others again were thrown up from the depths of the sea, as Hiera and Thia. Rivers were dried up, as the Bœotian Helius: or volcanoes suddenly blazed forth, as on Lemnos, the Arcadian Lycœum, and Methone in Argolis. The changes of the Caspian have given rise to the learned monograph of Kephalides, "de Historia Maris Caspii," scarcely two ancient writers agreeing as to its extent, form, or position, or as to the names, number and course of the rivers which it receives. Nor are oriental authorities wanting. The Chevalier Von Noroff, in a treatise published at Saint Petersburg, in 1854, has collected on this subject some curious extracts from Arab writers of the tenth century. One of these (Mas'ûdi, A.D., 943, 944), speaks of an old tradition that a bridge formerly existed at the strait between Spain and Africa, constructed of stones and bricks, over which passed camels and

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beasts of burden. Under this bridge flowed the ocean tide, divided into small canals. The water of the Mediterranean, however, rose gradually, and in course of time submerged one tract after another. Finally, the water flowed over the bridge, which, however, could be seen below the surface, long after, by sea-faring men. Another similar tradition, preserved by El-Birûni, is that, in old time, a damp, brackish soil, covered with rank vegetation, extended between Egypt and Constantinople.

Neither, again, according to the ordinary chronology, would there seem to be space enough for the evolution of all the multitudinous mythi of antiquity. These mythi are the deposit of long ages of a people's history. It can be only after a great lapse of time that the suspended matter of a mythus, be it historic, religious, or physical, becomes at length precipitated, or rather slowly deposited, and assumes a concrete and palpable form.

There may be those who think that the fossils, the cave-relics, and other signs and evidences of man's primeval occupancy, should be yet more numerous to warrant any certain conclusion. To these it may be replied that the ocean-bed is beyond the grasp of the geologist, that scarcely a tenth of the whole dry land has been surveyed, and of that tenth but a small part belongs to the tertiary or post-tertiary age.

And what, indeed, can be more reasonable than to suppose that when the earth was prepared for his reception, man should appear? In those primal azoic ages, when as yet the dry land was not, and our planet rolled onward through the void, covered with a boiling sea, and shrouded in vapours, so that emphatically, "Darkness was on the face of the deep," then, of course, his existence would have been an impossibility. So, also, during the time when those strange ganoids and placoids held their solitary sway; or later, when the dynasty of fishes was succeeded by that of reptiles, and the lias and oolite displayed their wondrous reptilian fauna. But at the close of the secondary period, there was a pause, a pause of expectancy. The crowning glory of creation, the centre of the mute prophesying of innumerable ages, man, the latest born and

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highest of terrestrial creatures, was about to appear. With the tertiary a new order of things arises: it has been said that it possesses scarcely a species in common with the preceding age,—that two planets could hardly differ more in their natural productions; and this break in the law of continuity is the more remarkable, as hitherto some of the newly-created animals were always introduced before the older was extinguished. It was a period of rest and tranquility; an exultant and abounding age. Creatures of a high order, the largest of the land mammalia, moved through the luxuriant herbage, or enjoyed the shady coolness of the riverside. And still, with the ever-widening dawn, the resemblance to our own world increased. The stately ruminants of the forest—the elk, the stag, and the bison appeared. The horse waited for his rider, and the steer for the yoke of the husbandman: flowers, like our own, enamelled a thousand fields, and the lark, as now, filling the air with song, soared upward to the gates of heaven.

And thus, the conditions of vitality being there, it is difficult to conceive of life itself being absent. Everything around us, the blade of grass, the drop of dew, teems with living beings. Life is enjoyed everywhere to the uttermost. There is no space lost. And not only is life present, but life advanced to the farthest degree of perfection which the supplied conditions will allow. The elements being given, the organism is the unfailing product, and the Promethean spark kindles at once into being. If human life then was possible during this period, we may rest assured that human life was there.

And they, the dwellers in their island-home, how lived they? What was their history? May we believe with Plato, that they became prosperous, rich, powerful,—were ruled by wise kings, received tribute from the neighbouring islands, and had long years vouchsafed to them of peace and plenty? And, finally, after sending out migratory swarms eastward, and perhaps westward, how did their island disappear? Was it submerged slowly? Or did it sink suddenly in ruin? We cannot tell. All is dark and uncertain. Yet, with the onward march of science, the day

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may perhaps come when its historic actuality will be made plain as the fact of its geological existence. Whatever the power and greatness of the old Atlantids, all now is vanished as a dream, lost and engulfed in a barren wilderness of waters. Festivals, processions, the meetings in the market-place, and uproar of congregated thousands, all is silent now. The ocean keeps its secret: summer and winter, sleet and sunshine, pass over its surface, but no sound or echo comes to tell of the sleepers below. Yet here, haply, were human affections and friendships, and all the incidents and realities of life. And when the suddenness of desolation fell upon them, it must have been with no ordinary pang that these children of the morning resigned the rich blessings they enjoyed, and descended into that darkness where as yet no Teacher had gone before. Buried thus in the lava and scoriæ of volcanic action, who can tell what subtle agencies of nature have since been at work? Who can say whether the infiltrated fluid, charged with calcareous or silicious earth in solution, may not, in the interval preceding the final submersion, have lapidified these sleepers, have turned them into stone, like the fossils and reliquiæ which form the study of the curious? If so, it may be that when, in the oscillations of the earth's crust, the Island of Atlantis, covered with its subsequent deposits, again rises to the surface, some future geologist may lay bare the secrets of that last convulsion, may gaze with reverence on the first-born of our race, and again expose to air and sunshine the reveller with his rose-wreath, the hierarch with his staff, and the mailed monarch with his sceptre and his crown.

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PAPER IX.—ON THE SECULAR CHANGE OF MAGNETIC DECLINATION IN CANADA, FROM 1790 TO 1850.

FROM THE RECORDS OF THE DEPARTMENT OF CROWN LANDS.

BY E. T. FLETCHER, ESQ.

(*Read before the Society, 17th May, 1865.*)

It has occurred to me that an examination of the various Returns of Survey of record in the Department of Crown Lands might be, to some extent, useful in furnishing additional data for the solution of that interesting problem in magnetic science which proposes to determine the limits, causes, and elements of the secular deflections of the magnetised needle. It is obvious that reliable observations in different parts of Canada, if obtainable, would be of great value, from the immense extent of the colony from north-east to south-west, nearly at right angles to the presumed direction of the magnetic isogonal lines. The records of the Department I have mentioned, comprising, as it does, the old Surveyor General's Offices for Upper and Lower Canada, and constituting, with its other formerly independent branches, rather a federation of offices than one Department alone, reach back for a full century; nay, even further, if we include the ancient seigniorial concessions and various special land descriptions of a date anterior to the conquest. As a surveyor attached to the Department for the last four and twenty years, I could not be blind to the possibility of some good from this source, though a closer examination of the older records has, it is true, somewhat lowered the expectations I originally entertained by shewing me how little, comparatively, of substantial and reliable fact was obtainable from these voluminous files, and that for these reasons:—In the first place, by far the greater part of the older surveys were performed by the needle alone

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reference to the true or astronomical bearing; in these, therefore, there was no mention of magnetic variation or declension; the only exception was where the side-lines of seigniories were concerned, which, by the old French arrêts or réglements, were required to have a fixed astronomical bearing—that is, due north-west and south-east on the St. Lawrence, and *nord-quart de nord-est*, or north 12¼° east, on the Ottawa. In these cases the surveyors were compelled to lay off a true meridian, and thus the variation was not unfrequently noted. In the second place, some surveyors seem to have carried the variation with them from one part of the country to another, and, having compared their circumferentor with the meridian stones set up at Quebec and elsewhere, to have travelled off with the variation thus obtained as a fixed and unchangeable element, good for all parts of the district. Thus the surveyor intrusted, some seventy years ago, with the survey of the Yamaska, the Richelieu, or the Chateauguay rivers, might possibly start from Quebec by batteau (for as yet steamers were not) for Three Rivers, and, having spent perhaps a week or ten days in the voyage, if the wind was unfavorable, would, on landing at the latter town, compare with every possible minuteness and care the magnetic bearing shewn by his circumferentor with the true north and south line given by the meridian stones. This done, he formally notes in his field-book or journal: "je trouve donc que la variation de non instrument est de dix degrès trente minutes;" and this ten degrees thirty minutes goes with him throughout an operation of perhaps many miles in extent as a constant and unalterable companion. Yet far be it from me to decry the merits of these patriarchs of the profession. Though sometimes a little shaky in theory, in practice they were frequently admirable. I have myself had frequent occasion to verify the accuracy of their work, and the journal of their operations shows a wonderful dexterity, quick-wittedness, and fertility of resource under difficulties. At times on the verge of starvation, or annoyed by the wild animals which at that time swarmed everywhere, or running dangerous rapids on small rafts, and losing perhaps some

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one of the party, they seem to have been always prompt, fearless, and uncomplaining, knowing their duty, and striving, like honest men, to perform it faithfully and well. Other causes of unsatisfactory observations are to be found in the entire ignoring the diurnal and annual variation, and in the imperfectness of the instruments themselves. Local attraction and disturbances have also been a frequent cause of error. As a proof of the liability to error from observed declination, where the diurnal or annual variation is not taken into account, I would only instance the annual variation, greatest, as is known, in June and July, and least in December and January. From the records of the Toronto observatory it appears that in January, 1841, the observed declination was 1° 11′ 1″; in June and July of the same year it was 1° 17′; while in the following year, 1842, the declination was in January 1° 14′, and in June and July 1° 20′. Thus the declination at Toronto, though increasing from year to year, is yet greater in June and July, 1841, than in January, 1842.

The observations of later days are free from many of these errors. The instruments now in use are of improved make and more accurate construction. The causes which influence the local and periodic disturbances of the needle are better understood and more clearly appreciated. The course of study, also, now required from candidates for the profession, is of wider scope than formerly. A reference to the 77th chapter of the Consolidated Statutes will shew the various branches of physical and exact science which form part of the course. Each candidate is subjected to two examinations: one on mathematical subjects alone, before being indentured; and a second, embracing all subjects, at the expiration of his term, and before receiving his diploma. There appears, therefore, reason to believe that in future, as now, magnetic observations of this kind may be received as, in general, reliable.

Towards the close of the last century, fixed meridian stones were laid down at Quebec, Three Rivers and Montreal. They are frequently referred to in the old returns of survey, and must have been of great use in determining the secular charge of declination in those several localities.

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On eleminating with care from the observations of record, giving priority of place to those which were obtained by direct observation of Polaris or of the Sun, or by comparison with the meridian stones, the following facts appear to be established :—

There has been a fluctuation or oscillation in Canada, as elsewhere, of the amount of magnetic declination. At Quebec, this horizontal deflection, which in 1649 is said to have been 16° W., and in 1686, 15° 30′, was in 1785, 12° 35′, and in 1793, 12° 5′ according to Major Holland, Surveyor General at the time. In 1805 it appears to have reached its minimum, being then only 11° 35′ in the same locality. In 1810 it had increased to 12° 30′, and since then it has either been stationary or slowly increasing up to the present day, when it is over 16 degrees. From 1821 to 1831 it appears to have remained unchanged at 13°. In 1840 it had reached 13½° ; in 1845 it was about 14½° ; in 1850 it may be set down as 15½°, and at the present day it is stated to be 16° 40′.

In Toronto the rate of increase appears to be about three minutes annually since 1840.

These fluctuations are susceptible of explanation on the well-known hypothesis of Hansteen, the Norwegian professor, who found that the supposition of two northern and two southern magnetic poles would best accord with the observed phenomena of terrestrial magnetism. Of these two northern poles one is stronger than the other, the ratio of intensity being about as 17 to 10. There is also a stronger and a weaker southern pole. The place of the stronger north pole was in 1790, in W. longitude 95° 37′ and in N. latitude 70°. The weaker north pole was then in E. longitude 127° 30′ and in N. latitude 85° 30′. In 1820 the stronger north pole was six degrees farther east, or in W. longitude 89° 24′, while the weaker north pole had meanwhile moved nearly thirteen degrees further east, and was in E. longitude 140° 6′ and in N. latitude 85° 12′, and finally in 1850, the stronger north pole was in W. longitude 83° 10′ and latitude 69° 14′, while the weaker pole had moved forward to 150° 40′ of E. longitude and 85° of N. latitude.

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Thus both poles move towards the east, but the weaker much more rapidly. Having therefore given the position of these poles at any time, and their relative intensity, it is not difficult to compute, by the doctrine of the composition of forces, the precise place of the resultant pole or that resulting from the two forces combined, and to which may be referred, as the true and absolute magnetic pole, all the observed phenomena of deflection. It will then be seen that this resultant pole sometimes moves to the east, sometimes to the west, and at others appears to pause and remain stationary for several years in succession.

In connection with this subject, I submit also a table of the magnetic declination at Quebec for several years, from 1649 for two centuries onwards, and also a table of Lower Canada declinations towards the close of last century. These tables are compiled almost wholly from the field-books, plans and *procès-verbaux* of surveyors, and from other official records. Among the most valuable materials are the recorded amounts of declination which in old times each surveyor found his circumferentor or theodolite to shew when compared with the meridian stones already adverted to.

I have also consulted a list of Upper Canada declinations, obligingly communicated to me by Mr. Russell, the Assistant Commissioner of Crown Lands, to whom the profession is in many ways largely indebted; but of these, the older observations appear to be so much at variance, and so hard to reconcile, that I have thought it best to abstain for the present from any publication of its contents, until I could see a little more clearly into the matter.

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THE DECLINATION OF THE MAGNETIC NEEDLE AT QUEBEC, DURING SEVERAL YEARS.

DATE.		DECL'N WEST.		REMARKS.
		°	′	
————	1649	16	00	From Encyl. Brit.—Article "Magnetism."
————	1686	15	30	do do
————	1785	12	35	Surveyor General Holland.
30th June,	1789	11	45	Louis Perrault, P.L.S.
22nd June,	1791	13	00	Pierre Beaupré, P.L.S.
24th March,	1792	12	15	J. B. Demers, P.L.S.
9th May,	1792	13	09	A. Dezery, P.L.S.
16th May,	1792	12	00	Ch. Turgeon, P.L.S.
do	do	12	15	Fr. Legendre, P.L.S.
————	1793	12	05	Surveyor Gen. Holland.
19th November,	1793	13	00	J. C. Antill, P.L.S.
— April,	1805	11	35	Reg. A., fol. 117, Dept. of Crown Lands.
5th June,	1810	12	15	do fol. 131, do
— June,	1811	12	15	do fol. 143, do
2nd October,	1820	12	30	P.L.S. Bourdages.
— November,	1820	12	35	do Livingstone.
25th August,	1821	12	15	Jno. McNaughten, P.L.S.
— September,	1821	13	00	A. Cattanach, P.L.S.
— September,	1821	13	00	W. Ware, P.L.S.
28th November,	1821	13	20	E. Tetu, P.L.S.
21st January,	1822	13	00	Jos. Hamel, P.L.S.
do	do	13	00	Ph. Verrault, P.L.S.
26th April,	1822	13	00	P. J. Bureau, P.L.S.
— May,	1822	13	00	Reg. A., fol. 162½.
26th March,	1823	13	00	N. Le François, P.L.S.
12th May,	1823	13	00	D. S. Ballantyre, P.L.S.
3rd October,	1823	13	00	Jos. Gamahe, P.L.S.
23rd October,	1823	13	00	A. Bochet, P.L.S.
14th November,	1823	13	00	L. Dorval, P.L.S.
2nd March,	1824	12	40	A. Cattanach, P.L.S.
20th July,	1831	13	10	Thos. Carrol, P.L.S.
Autumn of	1831	13	00	Jos. Hamel, P.L.S.
6th September,	1831	14	00	H. Corey, P.L.S.
10th December,	1831	13	12	John Newman, P.L.S.
— May,	1832	13	00	Reg. B., fol. 36.
— May,	1833	12	30	do fol. 43.
— July,	1833	13	00	do fol. 43.
10th March,	1834	13	00	Reg. A., fol. 197.
————	1834	13	00	Reg. B., fol. 61.
— July,	1834	13	00	do fol. 69.
— December,	1835	13	10	do fol. 85.
——— 1838 &	1839	13	00	do fol. 66.
— May,	1839	13	30	do fol. 144.
————	1839	13	35	do fol. 154.
20th May,	1840	13	50	R. M. Moore, P.L.S.
14th September,	1840	13	35	*Procès-verbal* by Jos. Bouchette, D.S.G.
7th December,	1842	13	50	Reg. B., fol. 281.—Anse des Meres.
————	1846	14	32	do fol. 318.—La Canardière.
17th September,	1847	15	30	do fol. 316.
20th September,	1847	14	45	do fol. 262.
13th October,	1847	13	40	do fol. 269.

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THE DECLINATION OF THE MAGNETIC NEEDLE AT QUEBEC, DURING SEVERAL YEARS—(*Continued*).

DATE.		DECL'N WEST.		REMARKS.
		°	′	
— February,	1848	15	15	Reg. B., fol. 277.
28th June,	1848	14	00	do fol. 299.
— October,	1848	14	30	N. LeFrançois, P.L.S.—Field-Book, C. 50.
8th March,	1849	15	30	Reg. B., fol. 316.
8th July,	1849	15	15	Reg. C., fol. 5.
— April,	1850	15	15	do fol. 13.
Autumn of	1851	15	00	do fol. 33.
19th January,	1853	15	30	Reg. B., fol. 320.
———	1865	16	40	

QUEBEC, 17*th May*, 1865.

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TABLE SHEWING THE DECLINATION OF THE NEEDLE DURING THE LAST CENTURY, IN CANADA EAST.

LOCALITY.	Date.	Var. °	Var. ′	Name of Surveyor.	REMARKS.
			W.		
Line between Seigniories of Rigaud, Vaudreuil and St. Joseph, and on the River Chaudière..	18th Sept., 1782...	15	00	Hon. J. Collins.....	From *procès-verbal.*
Point Fortune, on the Ottawa.....	22nd Sept., 1791..	8	00	Louis Guy	From *procès-verbal.*
Line between Seigniories of Beaupré and Beauport, near Falls of Montmorency.....	12th July, 1792...	12	00	J. B. Bédard.....	Do.
Intersection of line between Seigniories of Ste. Marie and St. Joseph, with the Chaudière River	25th Sept., 1792...	11	30	F. Legendre.....	Do.
Fishing town of Percé (Gaspé).....	——— 1792...	16	00	Wm. Vondenvelden	Plan of Percé, by W. V.
N. W. corner of the township of Shefford..... ..	31st Oct., 1792.....	11	05	Jesse Penoyer	Field-Book of Survey.
Confluence of the Rivers Chibouette and the Yamaska (Seigniory of DeRamsay).....	26th March, 1792.	8	30	Th. dePincier.....	Do. obtained by comparison of compass with stone boundaries having a due N.W. bearing.
Intersection of the line between Seigniory of St. Charles and Seigniories of St. Austin and St. Denis, with the River Chambly.....	April, 1792..	10	50	S. Z. Watson.....	Do. obtained by comparison of compass with three large cider posts planted to shew a due N.W. bearing.
At two boundary stones between the Seigniories of Sorel and St. Ours, on the west bank of the River Chambly.....	Do	11	00	Id.....	Do. obtained by comparing compass with the stones which were planted to shew a due N.W. bearing.
Town of Three Rivers.....	26th July, 1792...	9	45	J. Macdonell.....	Do. taken from the meridian stones.
Intersection of the Province line and the River Richelieu	3rd Nov., 1792.....	7	00	W. Dibble.....	Do.
City of Montreal.....	26th July, 1793...	8	15	Jerh. McCarthy.....	Do. taken from the meridian stones.
South line of Stanstead, near Lake Memphramagog..... ..	October, 1794.....	8	00	J. Kilborn.....	Do.
North line of Hereford, Lot No. 1.....	7th March, 1795...	9	00	Jos. Rankin.....	Do.

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Paper X.—ON SOME EARLY RECORDS OF THE MAGNETIC DECLINATION IN NORTH AMERICA.

By JOHN LANGTON, M.A., President.

(*Read before the Society, 17th May, 1865.*)

Mr. Fletcher having announced his intention of reading to the Society a paper upon the change in the variation in Canada, as deduced from the records of the Crown Lands Department, I thought it might not be uninteresting to call attention to some very much more ancient observations, which I have met with in the accounts of the earlier explorers of this part of North America. The attention which of late years has been given to all magnetic phenomena, and the care with which observations are made in almost all parts of the globe, bid fair to give us some insight into the causes which influence the change in the magnetism of the earth, and into the laws which regulate it. But as the secular change in the variation is very slow, and even if it is really periodic in its character, it has a cycle embracing some centuries, we must look back to the records of the past to obtain any accurate idea of its progress. With this view, collections have been made of all recorded observations for more than two hundred years, and maps have been published as deduced from them, shewing the isogonal lines as they existed at different dates during the interval. The earlier observations, however, are both few in number, and surrounded with much uncertainty, from the imperfection of the instruments in use, and from the doubt how far they may have been affected by local attraction, the influence of which seems hardly to have been appreciated till a much later period. Observations made on board ship, before the subject of the ship's compass error had been studied, and detached observations where no others have been recorded at nearly the same time

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or in the same neighborhood, must be received with considerable caution, and it is only when we have a series of observations, consistent with themselves, that we can place much reliance upon the results.

In looking over the declinations, as observed by the various land-surveyors in Upper Canada, which were obligingly communicated to me by Mr. Fletcher, one could not fail to be struck with the extraordinary differences obtained by different surveyors, and often by the same person in the same neighborhood. Much of this is no doubt owing to carelessness in the observations, and imperfection in the instruments used, but, in a great measure also, it evidently arises from local attraction. But if for this reason we can place no great faith in an isolated observation, if we take a number of them, nearly about the same period, and in various parts of the same region, we may obtain a sort of average, which may be depended upon as nearly correct. The whole surveyed portion of Canada forms such a narrow strip of land, that it hardly affords space enough to determine with any accuracy the direction of any isogonal line; but the locality in which such a line crosses Canada may be given with tolerable precision, and the direction may be obtained by comparing it with the ascertained declination on the coast. Thus, from 1819 to 1823, there appear to have been about twenty townships surveyed, in which the needle did not deviate as much as a degree either to the east or west of north; and the line of no declination, about 1820, passed through the counties of Brant, Waterloo and Wellington. Similarly at the same date the line of 5° westerly variation, passed through the counties of Leeds and Lanark.

By thus multiplying observations, both in different places, and at successive dates, we may also conclude that some remarkable discrepancies which present themselves are not mere errors, or the effects of immediate local attraction; but that some considerable sections of country really differ in their declination from the general course of the lines. Thus it would appear as if the line of no variation about 1820 bifurcated as it approached the shores

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of Lake Erie, and that the whole region about Lake Simcoe has had, over a period of many years, a less westerly declination than one would expect from that which prevails in the country adjoining it.

It is principally for this reason that I think the conclusions of Mr. Fletcher may have considerable value, though many of the individual observations are doubtless not very trustworthy; and this is also one of the reasons why I attach some importance to the determinations which form the subject of this communication—because they are a series, and consistent with each other. Moreover, rude as the method was by which they were made, it could only have been practised on shore, and they are therefore free from the disturbing effects of local attraction, which, without the greatest precautions, are liable to occur on board ship.

Their early date is also an important feature. In Europe trustworthy observations are recorded from a somewhat earlier period, though not in any great number; but in the list given by Hansteen, from which his map for 1600 is compiled, there are none recorded in this part of North America nearly so far back. The earliest in the list is that of Bressani for Quebec, which is evidently taken at second hand, for the date is not quite correctly assigned, whilst the declinations as recorded by him on the Great Bank, and in the country of the Hurons, are omitted.

Indeed, when Champlain explored the coasts of North America, in the very commencement of the 17th century, the subject was only just commencing to attract attention amongst navigators and men of science. It is often stated that the variation of the compass was not known until it was noticed by Columbus, and that the discovery that the needle no longer pointed to the north, almost gave rise to a mutiny amongst his crew. This, however, is a mistake, for the variation is distinctly alluded to by Petrus Peregrinus, in the latter part of the 13th century, and the amount of it is mentioned, though too vaguely to base any conclusions upon it. It is probable that we do owe to Columbus the first distinct information, that the variation is not the same in all parts of the

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world, and that the needle which pointed east of north on the shores of Europe, had pointed very much to the west of north before he reached those of America. From this time the fact was no doubt familiar to navigators; but I believe that the first known work, in which the importance to keeping a register of the variation in different parts of the world is enforced, is a treatise on navigation by Prince Maurice of Nassau, published in 1599. Only four years after this Champlain was exploring the coasts of New England and Nova Scotia, and that he was deeply impressed with the value of such observations is evident from the instructions he gives in his *Traité de la Marine*, and in the explanation of his maps. It had, indeed, in his eyes a greater importance then than it would have had, if he had pursued his explorations some thirty years later, for it was not until after his death that the next great fact in magnetism was discovered, viz., that the variation was not constant in any place, but itself varied from year to year. This discovery we owe to three independent English observers, between 1633 and 1640; but when Champlain was making his survey of the coast, it was thought that, however much the declination might vary in different places, in any one place it was always the same. Had this really been the case the declination would have materially assisted in determining the position of important points, and under favorable circumstances it might even now be a guide to the mariner, as Basil Hall describes himself, whilst sailing along the coast of Peru, in thick weather, to have found his latitude with considerable accuracy by observations on the dip. But in Champlain's time, when the navigator had no means of checking his dead reckoning, except by an observation for latitude, the declination, had it been constant, would have been a most important addition to his knowledge. It is with this view, rather than with the object of correcting his compass-bearings, and certainly not with the intention of investigating the laws of terrestrial magnetism, that Champlain includes amongst his instructions to mariners :—" N'oublier souvent à apprendre les déclinaisons de la guide aymant en tous lieux, qui est de sçavoir combien elle

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décline du méridien vers l'est et ouest, ce qui peut servir aux longitudes—ayant ces observations et retournant au mesme lieu d'où vous les aurez prises, trouvant les mesmes déclinaisons vous sçauriez où vous seriez, soit en l'hemisphère de l'Asie ou de la Pérou, et de ce on ne doit estre négligent."—He accordingly records several observations with this object, and upon one occasion, whilst endeavoring to identify a river which he enters (the modern Penobscot) with one described by former navigators as the Norembegue, he says that he cannot be sure of it, as, though the latitude corresponds, none of them have given the declination—speaking of it much as a modern geographer would of the longitude in a similar case. The coast which he was exploring was indeed peculiarly favorable for such a use of the declination as he found nearly 5° of change of declination in about 1° 30′ of latitude.

In connection with this subject there are some curious observations in the notice entitled *Intelligence des deux cartes géographiques*, in the edition of his voyages published in 1813. The smaller of the two maps, the only one preserved I believe in any copy of the edition on this continent, he describes as being constructed on the true meridian. It may be used, he says, when on the Great Bank by placing the needle from 12° to 15° or 16° to the west of the north point of the card of the compass—a vague enough determination certainly. But the other map, which is wanting, must be rather a curiosity. Although the separate ports, bays and capes were alike in each, the general configuration of the shores, he says, is quite different, because this larger map is constructed to suit a compass made like those of France, where the needle points to the east of north. It seems that the needle was not usually placed under the north point of the card, though Champlain recommends that as an improvement, but it was fixed about 8° 30′ to the east of it, so that on the coast of old France the card pointed due north. But when the earlier mariners shaped their course for New France, steering always west by their compass, they found themselves after a while several degrees too far south, to their great astonishment. Champlain himself appears to

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have a confused notion that the difference arises from the spherical form of the earth—that if they had been sailing on a plain surface the compass would have been a correct guide, but that as the surface of the earth is curved the compass varies, and the further north you go, and the greater the curvature of a parallel of latitude, the more rapidly the declination varies.

To return, however, to Champlain's records of observed declinations. His method of making the observations is described in his *Traité de la Marine*, and it is a rude kind of observation of equal altitudes. He placed a board perfectly horizonal in which was a perpendicular pin. In the morning he marked the place of the shadow of the top of the pin on the board, and describing a circle from the pin, he marked the point in the circle where the shadow of the pin touched it again in the afternoon. The line bisecting the angle thus formed was due north, and with this he compared his compass.

The localities where the observations were made are the following:—

Isle Madame, apparently in the entrance to the Gut of Canso, for which he gives lat. 45° 45′; dec. 14° 50′.

Cap La Heve, which retains its name with a somewhat different spelling, lat. 44° 11′; dec. 16° 15′.

Ste. Marguerite, clearly from the description inside of Digby Neck in the Bay of Fundy, probably the small bay called Sandy Cove, for which he gives lat. 45° 30′; dec. 17° 16′; but there appears to be an error of a whole degree of latitude, the real latitude being about 44° 30′. The error is probably a clerical one, for he is generally pretty correct in his latitudes.

Port Royal, in Annapolis Basin, lat. 45°; dec. 17° 32′.

Isle Ste. Croix, in Passamaquoddy Bay. I do not know that the exact situation of the small island has been ascertained. Lat. 46° 20′; dec. 17° 22′.

The entrance to the Norembegue or Penobscot river, lat. 44°; dec. 18° 40′.

Isle aux Tortues, at the entrance of Kennebec river, lat. 44°; dec. 19° 12′.

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Mallebarre.—The name is still preserved in that of Cape Malabar, to the south of Cape Cod; but the exact locality of the small harbor to which he gives this name is difficult to identify, and the latitude seems incorrect—lat. 40°, decl. 18° 40′.

The only other determinations of declination which I have noticed in Champlain, except the very vague one of from 12° to 15° or 16° for the Great Bank already mentioned, is where he states that the greatest amount he had observed was 21° in 45° lat. in the St. Lawrence. As a trifling difference in the latitude, which is only given in round numbers, would make a considerable difference in the longitude, the locality indicated cannot be satisfactorily ascertained.

The Jesuit Father Bressani, who seems to have paid more attention to scientific matters than most of his confrères, gives the following declinations:—

The Great Bank, rather a vague description, 22°; Quebec, 16°; the country of the Hurons, that is, the small peninsula bounded by Lake Huron, Matchedash Bay and Lake Simcoe, 12°.

I know not upon what ground the date, 1649, is given by Hansteen. Bressani first came out to America in 1642 and returned in 1644; he came out again in 1645, returning in 1650, and he says that in all his voyages he observed a similar change of declination. As at the period of the three latter voyages he was maimed from the effects of the tortures of the Indians, and oppressed by the recent calamities of his brethren, I should, in the absence of any better information, be inclined to take the date of the earlier observation, 1642.

It will be perceived that the declinations, as observed by Champlain, regularly increased as he proceeded south-west, and, as they thus seem to follow a definite law, we may look upon them as substantially correct. But it is remarkable that the case is now exactly reversed along the same coast, the declination decreasing pretty uniformly from Cape Breton to Cape Cod. It is not very easy at first sight to understand what position of the isogonal lines would have given rise to the variation as he found it. The main

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features of a magnetic chart for any period will be best understood by conceiving that over about one-half of the globe the variation is easterly, and over the other half westerly. There are, therefore, two lines of no variation, removed from each other by nearly half of the circumference of the earth. One of these, at which, if you are sailing to the west, you will pass from an easterly to a westerly declination, is now situated in Asia, and is very irregular in its outlines. The other, where you pass from a westerly to an easterly declination, which forms a much more regular curve, is situated in America, and just touches upon the western extremity of Canada. The lines where the variation is 5°, 10°, 15°, &c., westerly, may be drawn to the eastward of the American line of no variation, and to the westward of the Asiatic one, and following the same general direction; but as these lines occur at greater intervals near the equator than towards the poles, the lines of equal variation proceeding from its two neutral lines, soon meet towards the equator, after which the next set of lines return upon themselves, and the variation increases as you go to the north or the south. These lines are constantly changing their position, and the question is, where were they situated in the time of Champlain? Now, as in Champlain's time the declination in France was about 8° 30′ east, and in sailing to America he passed the line of no declination, and then increased his westerly variation as he approached America, the neutral line which he so crossed would appear at first sight to have been that now situated in Asia. It is by no means impossible that this may have been the case, as we have no means of tracing it over the continent of Asia, from where we find it at the same date in China and Australia; but if so, instead of reaching the Northern Ocean, as now, near Archangel, it must have stretched very far over the Northern Atlantic; for if on the coast of Nova Scotia he had been nearer to the American line, the declination would have decreased as he sailed to the west and to the south instead of increasing as he found it. This position of the isogonal lines would also correspond very well with the increased declination observed by him in the St. Lawrence, and it

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would not be inconsistent with the amount of declination assigned to the Great Bank.

Hansteen, however, in his map of 1600, imagines the American neutral line to have made a loop, somewhat similar to what existed in the Asiatic one at the close of last century, within which England and France were situated, so that the navigators, in proceeding to America, would cross the American neutral line where it returns upon itself to the southward, and they would thus pass from an easterly to a westerly variation, which could not be in any other part of the American line. It would be a case analogous to an overturn of geological strata, which appear to rest upon each other in the reverse order of their age. It is true that the position of the isogonal lines as laid down by Hansteen would accord very well with Champlain's observations, if the lines were made to run rather more north and south at that point; but the observations upon which he relies for his conclusions are very few in number, and there is some difficulty in imagining the changes by which the map of 1600 could be converted into that of 1700, particularly when we take into consideration the facts ascertained for intermediate periods, such as Bressani's, in whose time the declination in France was 3° 30′ E., the line of no variation, being, as he says, about the Azores, and the westerly variation decreasing, as it does now, as you proceed to the south and west from Newfoundland up the St. Lawrence. Whichever solution of this difficulty we may adopt, there is one fact connected with the localities we are considering which is very remarkable, and which may not be without its significance —that from the earliest observations to the present time there has hardly been any sensible change in the variation in the neighborhood of Cape Breton. It appears to be a true neutral point as far as the secular variation is concerned. Round this point the line of 15° westerly variation has revolved, in the direction of the hands of a watch, through about a quadrant of a circle in about 250 years; its direction having been in Champlain's time nearly S.S.W. and N.N.E., and at present, W.N.W. and E.S.E. About the close

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of the last century, though the exact date varies in different localities, a change appears to have occurred in the direction of magnetic oscillation in almost all parts of the world. In Canada, the line of no variation seems to have been advancing towards the east, during the last century, till almost all our western peninsula had easterly variation, but it has since been moving towards the west, till it has almost entirely passed off our boundaries, and the declination is now increasing westerly over all Canada. At Toronto it has increased from 1° 14′ 3″, in 1841, to 2° 21′ 9″, in 1864, or at the average rate of 3′ annually, and at Quebec the rate is apparently rather greater. The exact period of the change in Upper Canada cannot be well ascertained; at Quebec it appears to have nearly coincided with the commencement of this century, as may be seen from the following table:—

1642	16° 00′	Bressani.
1686	15° 30′	Des Hayes (Hansteen).
1785	12° 35′	Surveyor General Holland.
1793	12° 05′	do do
1805	11° 35′	Smallest observed.
1840	13° 35′	Surveyor General Bouchette.
1860	16° 00′	

We have thus returned to the same amount of declination which Bressani observed 220 years ago.

It is the same all along the Atlantic coast, as may be seen from the following table, extracted from the reports of the United States Coast Survey.

Cambridge, Massachusetts:—

	DECLINATION.	
1708	9° 00′	Earliest recorded observation.
1782	6° 48′	Smallest recorded.
1842	9° 34′	

Providence, Rhode Island:—

1717	9° 36′	Earliest.
1790, 1795	6° 10′	Smallest.
1848	9° 15′	

New York:—

1750	6° 22′	Earliest.
1789	4° 20′	Smallest.
1845	6° 25′	

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Hatboro', Pennsylvania:—

	DECLINATION.	
1680.....	8° 23′.....	Earliest.
1790.....	1° 50′.....	Smallest.
1850.....	4° 25′.....	

From the observations at 18 stations in the United States, as given by C. A. Schott, United States Coast Survey, 1859, App. 24, the period of the change in the oscillation varies from 1765 to 1815, and the conclusion is drawn that the period is later the further you go South and West, the change of oscillation not having yet occurred on the western coast. It is to be observed that that in the same paper the date of the change at Quebec is given as 1769, which does not, by any means, accord with the observations which we have recorded.

One of the great uses of societies like our own, is to afford opportunities to persons who have neither the leisure nor the attainments necessary to conduct sustained scientific investigations, to contribute, nevertheless, occasionally a stray fact, of which the working men of science may take advantage. I had seen only an imperfect notice of Bressani's determinations of declination, and none at all of those of Champlain, which appear to me important, not only from their early date, and the character of the man for accuracy, but also from their remarkable deviation from the law now regulating magnetic variations in the same region. I desired to make this Society the medium of putting them on record in a more accessible shape, than when buried in two rather rare books, and I have taken the same opportunity of treating upon some of the general features of a rather complex subject.

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TRANSACTIONS

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Literary and Historical Society

OF QUEBEC.

SESSION OF 1865-'66.

NEW SERIES—PARTS 4 and 5

Quebec:
PRINTED BY MIDDLETON & DAWSON, AT THE "GAZETTE"
GENERAL PRINTING ESTABLISHMENT.
1867.

REPRINTED FOR THE SOCIETY by *La Semaine Commerciale Ltd* — 1927

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TRANSACTIONS

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TRANSACTIONS

OF THE

Literary and Historical Society,

OF QUEBEC.

SESSION OF 1865-6.

PAPER I.—OPENING ADDRESS.

BY REV. JAMES DOUGLAS VICE-PRESIDENT.

(Read before the Society, 15th November, 1865.)

The untoward event, which imposes upon me, the youngest of the Vice-Presidents elected at the beginning of the year, the necessity of addressing you at the opening of another Session, has suggested a subject.

Heretofore with the departure of the Government our Society has declined. Its return has revivified it. But the animation which it more than once thus temporarily inspired was not vigorous enough to maintain much activity for any length of time after its removal. Must it be so again? Or have we not within ourselves strength enough to stand, yes, and walk, without the assistance of so unreliable a prop. If, under our present organization and mode of procedure we have not, can any change be made which would ensure so indispensable a result? To assist us in our answers I shall trace the history of the Society from its first establishment, and thereby show you what has been tried, and with what success.

The origin of our Society was explained last year by one of the original members, the Hon. W. Sheppard, in an

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address at a conversazione of the Natural History Society of Montreal. " Strange to say ", he remarks, " its formation was brought about indirectly by a political movement in this wise: It is no doubt known to many of you that the late John Neilson was the owner of the *Quebec Gazette,* established in 1764. In virtue of an Act of Parliament, it possessed the privilege of publishing all official documents as they occurred. Neilson was a great politician, and was opposed to Lord Dalhousie in some points of government. This opposition Lord Dalhousie could not tolerate, and he came to the determination of establishing a paper which he could control, calling it the *Quebec Gazette, By Authority;* and he caused Dr. Fisher, co-editor of the New-York *Albion,* to come to take charge of it. Dr. Fisher had been a member of the Literary and Historical Society of New-York. He persuaded Lord Dalhousie to get up a Society with similar title and object in Quebec. This was done; Chief Justice Sewell (a slight error, as we shall see hereafter) became the first President, and Mr. Green the Secretary. The Society was in the first instance composed of high officials and courtiers, and the fee was fixed at a high rate, for some end which can only be guessed at ". For the reasons Mr. Sheppard stated the *Gazette* is silent as to the young association; but the *Mercury* even then commenced to yield it that firm support from which it has never wavered. Though Dr. Fisher may have given a name and form to the Society, the idea seems to have originated with Lord Dalhousie himself; for as A. Stuart, Esq., the president for 1838, states in his obituary notice of the noble founder: " The establishment of a Literary Society in Lower Canada appears to have occupied his thoughts from his first arrival. His impression probably was, that the time was now come when such an attempt could be made with some prospect of success, and that the Lower Province, the oldest of the Colonies, was the place where it ought naturally to originate. Accordingly, in the course of the year 1823, he called together, at the castle of St. Louis, a number of persons favourable to his design, and in a short address explained to them his views.

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After apologizing for taking the lead in the absence of any other likely to do it, he stated that the advantages of such an institution were indispensable,—that, independently of other subjects of research open to all, the early history of Canada, and the language and customs of the *aborigines,* offered an immediate and prominent ground of enquiry, and concluded by offering for himself an ardent zeal and most anxious desire to promote the success of the Society by every means in his power.

" The first meeting of the Society was held on the 6th of January 1824, when an election of officers took place, and his lordship was nominated patron ".

The meeting to organize and accept the laws and bye-laws was held in the Castle of St. Louis, on Monday, the 16th of March, 1824. The Society then received the name it has ever since borne; and a constitution, not essentially different to that now in force, was adopted. There were fewer officers, however, and much higher fees. By law No. VI. it was enacted that "members of the Society, resident in the Province, shall pay, on admission the sum of five pounds, and the annual subscriptiion shall be three pounds, payable during their residence in the Province ". Accompanying the report of the meeting, is an address to the public, detailing the objects which the promoters of the Society had in view, viz.:—" To discover and rescue from the unsparing hand of time the records which yet remain of the earliest history of Canada ";and, as secondary in importance to that, " to promote every means of discovering, collecting, and procuring whatever information may throw light on the natural and early civil and literary history of the *British Provinces of North America* ".

The officers elected for the year 1824 were:—

FOUNDER AND PATRON.—*His Excellency the Right Honble. George, Earl of Dalhousie.*

PRESIDENT.—*His Excellency the Hon. Sir Francis E. Burton.*

VICE-PRESIDENT.—*The Hon. Chief Justice Valliers de St. Real, Esq.*

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RECORDING SECRETARY.—*William Green, Esq.*

TREASURER AND CORRESPONDING SECRETARY.—*John Charlton Fisher, Esq., LL.D.*

"At this meeting Lord Dalhousie fully redeemed the pledge held out in his opening address, by granting annually out of his own resources the sum of £100, during the period of his stay in the Province. By means of this munificent grant the Society was enabled to enter upon the collection of a museum and apparatus, with a rapidity which would otherwise have been impossible, with its scanty resources and the paucity of its members at that period".—*Council Report of* 1824.

Thus did the Society alienate its first funds from the avowed object of its pursuits, Canadian history and antiquities.

Lord and Lady Dalhousie continued to take a lively interest in the welfare of the Society. Her Ladyship presented to the museum a collection of Canadian plants; and on their departure, his Excellency addressed an autograph letter to the President. This letter came into the possession of our late Council Secretary, who presented it to the Society before his removal to Ottawa. It is as follows:—

"Castle of St. Louis, 3rd Sept., 1828.

"Mr. President,—

"Deeply sensible of the many favours and distinguished honors which the Literary and Historical Society has conferred upon me. I cannot take my leave of it without expressing the pride and gratitude which the recollection of them will constantly nourish in my mind, and which will ever lead me to take the warmest interest in the advancement and prosperity of the Institution.

Upon the hour of my departure, I feel one act of duty still incumbent on me, and which is important to the great object of all our wishes; it is an act that would be felt painful to myself, were it not leading to the welfare of the Society, and, therefore, only am I gratified in the performance of it.

"In resigning my station here as his Majesty's representative in this country, I must also resign the distinguished title of 'Patron of this Society'. The presence of the patron at the table is too important to be dispensed with, and I therefore return into your hands an honour which I have ever highly appreciated, and shall never cease to appreciate as I ought.

"I have the honor, Sir, to be

"Your much obliged and faithful humble servant,

"DALHOUSIE.

'To the President of the Literary and Historical Society,
"Quebec".

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He was not the last governor that bore the name of patron, and really performed some of a patron's duties. Sir James Kemp, his immediate successor, identified himself with the Society as intimately as its founder had done. Lord Gosford's name and annual subcription appear at the head of the list of ordinary members, and Lord Durham inaugurated his connection with the Society by the donation of the splendid collection of the Greak and Latin classies, a few volumes of which have escaped amidst the vicissitudes to which the library has been exposed, and, by presenting the Society with a number of valuable manuscripts, copied at his own expense in France. Some of these were printed in the volume of Historical Memoirs published by the Society in 1840.

The exclusive character of the Society, and the high annual subscription, invited opposition. A new Society was started, under the presidency of Colonel Joseph Bouchette, with somewhat the same aim as the Literary and Historical. It was named "The Society for encouraging the Arts and Sciences in Canada". Of course it was discountenanced by Lord Dalhousie, but nevertheless prospered, and could soon boast of a longer list of members than its more favoured opponent. There can never, however, have been any hostility between the competing associations, as the most active members in the one were leading members in the other. But one difference is very observable between them. This Society of Arts and Sciences obtained the support of as many French as English. After the amalgamation, however, the French seemed soon to withdraw, and the united Society has never enrolled many of them on its list. This amalgamation was brought about through the intervention of Sir James Kemp, in 1829.

The joint Societies retained the name of the elder branch, and continued in the pursuit of the same object they had both heretofore followed. For in the first volume of our transaction, published in 1829, out of 17 papers, but three are on historical subjects, two only of which bear upon American topics, and that despite the repeated

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determination that the Society should really sustain its character as a depository and disseminator of historical tradition.

A special grant of £250 was in that year made by the Legislature. It was principally laid out on philosophical and chemical apparatus, allowed in a report of a few years later to have been of little or no service, as the Society never had a laboratory or theatre suitable for experimental illustrations and lectures, even if members had been found desirous of so using them. The appointment of curator of apparatus, now so complete a sinecure, was then a responsible office.

In 1831 our present charter was granted to the Society; it issued a second volume of transactions as bulky as the first, and bade fair to enjoy increasing prosperity. It was composed of the most influential men of the city, many of whom, besides lending their name and contributing their subscription, really assisted in its work. In 1836 the report of Council gave the following:—

Honorary in Europe and America.....	61
Corresponding.....	96
Ordinary and Associate.....	154
Actual residing members supporting Society	127

It was the only period in the history of the Society when it could be said that "any considerable accession was not to be expected, as it already embraced a large proportion of the resident inhabitants, who from their tastes and pursuits might be induced to give it their support"

The 3rd volume of Transactions, containing 38 papers, appeared in 1837.

In 1838 was published the 1st volume of Historical Memoirs. It was followed in 1840 by another collection of documents, obtained from the archives and public offices of France by Lord Durham and the Revd. M. J. Holmes, of the Quebec Seminary; and in 1843, by a republication of some old and inaccessible narratives of early North American discovery.

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But the political troubles which convulsed the Province during the latter part of the decennial period from 1830-40, diverted the public mind from any quieter pursuits than politics. This told upon the Society, not so much in diminishing the number of members as in what is even more injurious, diverting their attention and lessening their interest in its special objects. Then, in 1839, arose the lament which we are echoing to-day, the removal of the civil government with its many efficient members. The hold which the Society had on the public mind before the Rebellion it appears never to have recovered: for though it now occupied spacious rooms, in the old Parliament Buildings; had a mineralogical cabinet of over 1300 specimens; and the care of the extensive collection of stuffed animals, made by M. Chasseur, and owned by the Province; and a well selected library of a thousand volumes, the annual reports complain of a " falling off in the attendance at meetings ", and that " few original papers were read before it in the ordinary course ", Rep. for 1840; or that " the funds are in a very low state ", Rep. for 1841. This condition of things was still further aggravated by the establishment of the Quebec Library, and the Quebec Library Association, which evidently offered greater attractions than the old Society, and won away its members from their adherence. To so low an ebb did affairs at last sink, that subscriptions were received in 1850 from only 14 members, and more than once only two papers are reported as read during the session.

In 1852, the return of the government was hailed as a relief in so desperate a condition of affairs; and certainly it did somewhat fill up the list of members. But its coming was not unattended with drawbacks; for parliamentary requirements compelled that the space allotted to the Society should be restricted. So cases were pulled down and cut to pieces and re-erected, only again to be pulled down and huddled together in greater confusion than before. Sorrowful are the complaints of the Council, and indignant its appeal for compensation. But compensation

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never came. A general conflagration however did come to solve that question, and give rise to several others. The Parliament Buildings were burnt down in 1854, and the Society went in search of lodgings. They found some rooms over Henderson's grocery store, in St. Louis street, and thither they removed what of their property remained. But the fire, and the accession to their numbers from among the government officials, and a grant of £250 to make up for losses sustained, revivified it: for the meetings began again to be attended, the full complement of papers was read, and in 1855 there was published Vol. IV. of the Transactions, which had been so long in press that two of the members, who contributed papers to it, had died ere it appeared.

Then the government again left, and the Society, in consequence, again languished. Yet it succeeded in paying rent for its miserable accommodation, and even moved into somewhat better lodgings in St. John street. There, in the course of time, the government once more found it.

All those who had previously belonged to the Society again joined, and to their number was added our present President, to whom certainly, more than to any dozen members, is due the praise and honour of raising the Society to the comfortable position it now occupies. But this result even his energy and tact would hardly have brought about, had it not been for another fire, which, this time, as you all remenber, left us only 700 sodden and coverless books, out of the fine library of 4,000 volumes, which had been amassed up to the year 1862. The few moth-eaten, unearthly-looking creatures which had been saved from the museum in the first fire, we were spared the trouble of burning; and after the fire we sold all that remained of our apparatus for old brass. The fire had the good effect, however, of awakening our fellow townsmen to a recollection of our existence, and created such sympathy in our favour that an increase of members rapidly followed. Besides which, an arangement was made with Morrin College, whereby we have come to occupy more becoming quarters than the Society has enjoyed

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since she was so unceremoniously turned out of her fine apartments in the old Parliament Buildings, and shoved into a corner.

Since 1862 we have had not only a full roll, but we have done our due share of work. Under Mr. Faribault's editorship there have been published a pamphlet, appended to the transactions of 1862, entitled "Documents sur Jacques Cartier" and a "Mémoire du Sieur Ramesay;" and to the Transactions have been added 24 papers. A classified catalogue of the library was also issued in 1862.

And now we have arrived again at one of the crises in our history, when we are called upon to rely on our own resources. Is the result to be what it heretofore has been, or is it not?

It is certainly disheartening, this review of the past and its failure: for there were always some members whose whole hearts were in the work, and who spared themselves no troubles in furthering its cause. At first there were such men as Capt. Bayfield, Lieut. Baddeley, Chief Justice Sewell, and Mr. Stuart; and afterwards there were those who had served the Society in its brighter days, and who lived or remained in town to support it in its days of adversity. Take, for instance, the late Dr. Wilkie. In 1844, when the attendance at the meetings was by no means encouraging, of seven papers read no less than four were by him. And he was not alone in his attachment to the once prosperous undertaking. There were the late Arch. Campbell, Esq., who never forsook it, and whose name stood in the Treasurer's books from the time they were first opened till the year of his death; and that single-hearted man, Robert Symes, and the Messrs. Cary, father and son, and Judge Black, who, though he never took part in the proceedings, never withdrew his name from the list; and our old friend M. Faribault, and a Capt. McDougall, who not merely worked hard in the Society's interests, but gave it his extensive collection of charts and atlases and nautical works.

And there were many experiments tried to encourage

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literature and keep the Society in working order. For instance: prizes were for many years offered for the best essays in any branch of science, literature and art, in prose or poetry, as well as for the best historical and landscape painting, or piece of sculpture. But so very few competitors were found, that when the plan had been tried once and again, it was finally abandoned as a hopeless failure after 1852—the last occasion on which the Society's silver medal was offered for competition. Public lectures also were delivered under the auspices of the Society, but with no better result. So many attempts ending unsuccessfully, one is almost driven to admit that it is a hopeless endeavour, that of keeping the Society in a healthy, vigorous, working condition; and that its prosperity must oscillate with extraneous influences, till at last some time or other there shall be such a run of baneful circumstances against it, that it must succumb, as so many others have done before it. But it would be ignominious to yield to such an issue without a struggle; and if that struggle is to be made with any good prospect of success, we should begin it before the flush of good fortune subsides, and a fresh decline sets in.

One notable circumstance has struck me in looking over our old reports: that so few young men have taken an interest in the Society. Unfortunately this is an evil that can hardly be wholly remedied, yet, as one of our objects is to diffuse a taste for higher pursuits than too generally occupy the leisure of our young men, and offer food for its gratification, we should bear in mind, in the disposal of our funds, that we have to work upon those who are disinclined to literary occupation, and must, therefore, be tempted by the amenities of literature. That can be done without filling our shelves with novels. And measures might be taken for carrying out the p[illegible] plated last year, of admitting, at a reduced [illegible] cription, and with only limited privileges, [illegible] useful class of our young men, to whom th[illegible] the full fee might be so burdensome as to exc[illegible]

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A subject upon which no single report is silent is the Legislative grant. Except on two occasions, and that for special purposes,the grants from 1831 to 1860 never exceeded £50 per annum, and in 1835 and 1836 failed altogether. In 1860, on the return of government, it was raised to $1,000, at which it stood the year following, and has been subsequently reduced to $700 per annum. It would be unreasonable to suppose it will continue to stand at that high figure, and therefore we should count upon its reduction. But might not our funds be recruited from some other source? I find as much as £17 have been raised per annum by the sale of our Transactions, when I presume they were not distributed gratuitously to our members. Now this gratuitous distribution necessitates the publication of a larger number than would otherwise be required, and serves very little purpose; for those who are interested in their contents would not complain at paying a trifle for the yearly number, and those who are not, throw the book into the waste paper basket, and it goes the way of all such reading matter. The subject is worthy of being again re-opened, and with it other questions respecting our Transactions. However little they may be esteemed and read among ourselves, they occupy a place in foreign libraries, side by side with the proceedings of more illustrious societies, and therefore give us a status which is of no little importance to us. I should, therefore, be sorry to see their publication discontinued. But they might still be issued, though at a less cost, and in a manner calculated to keep our doings more prominently before the public than they are. I refer to their publication in some one of the local newspapers, previous to their being embodied in a volume, not, however, in the skeleton form in which they appeared in the Canadian Journal in 1854. The subject is now under consideration by the Council. In like manner we might continue the publication of interesting manuscripts, which in fact has been done this past year by our Librarian, at a much lower cost than the work could otherwise have been accomplished. And this brings me to another remark, which has been often made

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(and I think with justice), but cannot be too often repeated that the Society does not adhere closely enough to its avowed object, the gathering and publishing of historical and archaeological matter, illustrative of the aborigines of this country, and of its earliest European settlements. Every year the Indian tribes are perceptibly fading away before the influence of European civilization, either dying out under its uncongenial system, or losing their identity in the unequal amalgamation. In the recollection of even the younger among us, much of the naturel character of the aborigines in our neighbourhood has been lost. Such a gathering as welcomed Lord Durham at the Castle of St. Louis could not be collected now. Their costume will soon be doubtful, and their manners and costoms extinct, while many an interesting point, which could still be decided, will be left without the possibility of solution. Then again with regard to our local history: one of the most interesting sources of information in writing it would be the *Quebec Gazette,* whose establishment dates back beyond a century. But of this important work only one complete copy exists, and that in the possession of a private family, where it is doubly exposed to destruction by fire or other accidents. Under these circumstances, would it not be wise to avail ourselves of this and such other advantages as are still within our reach; and would not doing so give a zest to our proceeding, and enlist in our interest many who are now very lukewarm? I mean that it would be well if some of our members who are in earnest would pursue their studies in that line, and employ their leisure in what would not only be found absorbingly interesting by themselves, but would be of permanent benefit to history.

But what is of hardly less importance is the possession of suitable and permanent accommodation for our Library and Musuem. Much of the Society's funds has been wasted in transporting its cumbrous effects from one place to another, and making the necessary alterations in its furniture, which every fresh remove entailed. Feeling this,

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the Society has twice endeavoured to remove this obstacle to its progress. In 1844 there were overtures made to the other literary Societies then in existence, with a view to a general union of their property, and a fusion of their respective laws and bye-laws into one code. It was thought if this could be effected, their combined resources would suffice to erect a building devoted to their exclusive use. As might have been foreseen, the scheme came to naught. Ten years later (after the fire at the Parliament Building), a fresh attempt was made. The attempt and its failure are thus referred to in the Council Report of that year: "It may be mentioned that the Society has long been anxious to secure a building for its own use, where its museum and library might be deposited in safety, and in such a way as to be available, as heretofore, to the public generally, and in which we may be able to eventually establish an Astronomical and Meteorological Observatory, in connection with and under the auspices of the Society.

"In order to carry out these objects, the Council applied to the Head of the Government for a grant of a portion of the Ordnance property, on the north side of the government gardens in this city, sufficiently large for such a building as they thought necessary. We regret to say that this application, although favourably received by the Head of the Government here, has been refused by the Ordnance Department at home; the reason assigned being that the ground may be required for military purposes, in the event of the head-quarters of the military government in the Province being transported to this city.

" It is much to be regretted, for many reasons, that the prospect of being possessed of a building is not likely soon to be realized; yet we hope that our successors in office will not be discouraged by the failure of our efforts in that respect, but that they will endeavour to devise some expedient for securing for the Society a local habitation, in the enjoyment of which they cannot be disturbed ".

The injunction laid upon us is worthy of our attention.

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If is true that a more advantageous arrangement than that with Morrin College could not well be made; but how long our connection may last is extremely doubtful; and whenever it does terminate we should be prepared with some feasible scheme for the erection of a building of our own. Perhaps it might be worth while renewing the application to the Imperial Government. Could we obtain a site on easy terms, I apprehend there would be no serious difficulty in raising the means for the erection of so humble a building as would answer our requirements. The Provincial Government would probably contribute something, and the balance, I am sure, would be subscribed by ourselves, with some aid from our friends. The project should be kept constantly in view; for its consummation would tend more than any thing else towards giving stability to the Society.

It remains now with ourselves to interrupt the invariable sequence of events which has heretofore followed the removal of the seat of government from our midst. We have still, after omitting the names of members whom we have thereby lost, over 100 on our roll, and we have good promise of their activity in the number of papers already promised for the coming winter; but still it will be only by redoubled energy on the part of all that we shall be able to retain the prosperity we have enjoyed the last three years.

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PAPER II.—ON THE COAL-LIKE SUBSTANCE, OR "ALTERED BITUMEM," FOUND IN THE EXCAVATIONS AT FORT NO.3, POINT LEVIS, AND THE PRESENTLY ACCEPTED THEORIES ON THE ORIGIN OF COALS, BITUMENS, AND PETROLEUM SPRINGS, WITH AN ACCOUNT OF THE "CARBONIFEROUS SYSTEM" OF BRITISH NORTH AMERICA.

BY DR. WILLIAM JAMES ANDERSON, L.R.C.S.E.

(Read before the Society, 29th November, 1865.)

When it was announced in the Quebec journals, during the past season, that coal had been discovered in the excavations at Fort No. 3, at Point Levis, the report was received by many with total disbelief, by several with doubt, and by others with implicit faith. Such as believed in Sir Wm. Logan, or received dogmatically what he had said or written—or was believed to have said or written—laughed in scorn, affirming that Sir William had proved conclusively that coal could never be found in Canada. Those who doubted, though they admitted that from the absence of the carboniferous system of rocks, it was not very probable that coal would be found under the received condition, yet believed that it was not impossible, from what had occurred in the adjoining Province of New Brunswick, that coal, or at any rate a substance possessing many of the most valuable properties of coal, might be found in sufficient quantity to make it of economic importance. The third party, having no faith in Sir William, or the science which he has done so much to elucidate and adorn, but believing all things possible, not only believed that coal had been found, but would have been equally ready to admit that a deposit of gold, silver, and precious stones had been discovered, similar to that in the tunnel through Mount Cenis, of which such *authentic* accounts have reached us.

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Believing that vague and, in the minds of many, very erroneous views prevail on the subject, I have thought it might be interesting to the Society to have it brought under review; and as I am aware that some of the members have not hitherto devoted their attention to geology, in treating my subject I shall endeavour to divest it, as much as possible, of technicalities.

It is frequently, and very properly asked, how can any geologist undertake to say that coal cannot be found in one district, and as certainly that it may in another; that gold would be found in abundance in a locality which he had never visited, and which was only known to him by reports as to its general features; and that it would be vain to seek for it in another district. The answer to this is: that geology is based on observation and deduction, and that its students have been able to classify, in distinct series, the various strata of which the crust of the earth has been found to be formed. It will be convenient for me to recognise two grand natural divisions: the igneous, or volcanic and plutonic, and the aqueous or neptunic. The igneous, as the name implies, have been produced by the agency of fire, and are the lowest in the series; they are also called azoic, for no traces of animal or vegetable life being found in them; they comprehend all the granites and certain porphories. The aqueous are also designated *sedimentary* or stratified, from their having been deposited at the bottom of the sea, in strata or layers; they are likewise known as "*fossiliferous*", from their containing the remains of contemporaneous animals and plants. Between these two great divisions we have a very important series, the metamorphic or "*changed*" rocks, which may have been orignally sedimentary, and containing organic remains, but have been so completely changed by the action of fire, or some other agency, as to have lost their orignal structure, and all traces of organism.

When we come to consider the received theories of the origin of coal, you will at once see that we need not look in the first division for coal, but must search for it among the stratified rocks; and I think that I will be able to

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adduce facts which may justify the expectation that in the neutral ground of the metamorphic rocks, we shall find some *metaliferous* and some *carboniferous*. "The oldest geological formations," says Dr. Dawson, "are of marine origin, and contain remains of marine animals, with those of plants supposed to be allied to the existing seaweeds. Geology, however, cannot assure us, either that no land plants existed contemporaneously with these earliest animals, or that no land flora preceded them. These oldest fossiliferous rocks may mark the commencement of animal life, but they testify nothing as to the existence or non-existence of a previous period of vegetation alone. That there were plants before this period, we may infer almost with certainty from the abundance and distribution of carbonaceous matter in the form of "graphite" in the Azoic or Laurentian rocks of Canada; but of the form or structure of these plants we know nothing."

Among the systems of stratified rocks we find an extensive series, surmounted by a system called the "*newred*", and underlaid by another called the "old red sandstone; and to this, the term carboniferous or *coal*-bearing has been applied. This system is of inestimable importance in an economical point of view; it is also of great interest to the geologist, from the singular and interesting fossils which it contains, which bear testimony to the changes which the earth's surface has undergone, and to the character of its animals and vegetables during a very long and important period of its history.

On the western coast of the county of Cumberland, in the Province of Nova Scotia, fronting Chiegnecto Bay, there is an extensive range of cliffs, which have been cut and kept clean by the action of the water, and which furnish the finest and most complete section of the carboniferous systems to be found in the world. So wonderful is this section, that, as early as 1842, the now well-known "South Joggins" attracted the attention of Sir Charles Lyell and Sir Wm. Logan—both of whom visited the locality for the purpose of verifying their theories on the

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formation of coal. In 1852 Sir C. Lyell, accompanied by Dr. Dawson, again visited the Joggins, and made a detailed examination of that portion where the coal seams are most frequent. Of this examination Dr. Dawson, in his "Acadian Geology," has furnished a most minute and interesting account: and it is the best view I have found of the carboniferous system and the formation of coal, I have thought it advantageous to give you an epitome of it. I may here mention, however, that Sir Wm. Logan had some time before made a detailed examination, and had estimated the total vertical thickness of the carboniferous formation at no less than 14,570 feet, or about three miles, and found them every where *devoid of marine organic remains.*

After describing 7636 feet of strata, which consisted of sandstones, marly clays thick bed of limestone and gypsum, Dr. D. says, they reached the commencement of the true coal measure, extending over 2800 feet; and this, for the matter of convenience, Dr. Dawson has described under 29 sections, the sum of which is as follows:—The entire section contains 76 beds of coal, and 90 distinct stigmaria underclays. All the coals, *except two,* rest on stigmaria underclays; and there are 16 stigmaria underclays without coals. Erect plants were observed at 22 levels. There are 24 bituminous limestones, 17 of which are immediately connected with seams of coal.

Referring to the term "stigmaria underclay," used above, it may be here explained that underclay is technically applied to the bed of clay which *generally* underlies a coal seam. "Stigmariae" are very peculiar fossil roots, of very frequent occurrence in the coal measures, and now ascertained to be the roots of an extinct tree called the sigillaria, which is considered to have been a principal agent in the formation of coal. The stigmaria derived its name from the pits or spots left by its rootlets;—the sigillaria, from the rows or leaf-scars which extend up its trunk. The roots of the stigmaria at their departure from the trunk are four, which divide, at equal distance, into eight, sixteen, and thirty-two branches, each giving off an immense number of rootlets.

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Believing the underclays to have been soils, we have reason to conclude that the coal seams were originally vegetable matter accumulated in the manner of peat; for, on a minute examination of the coal, it is found to be composed in part of woody fragments sometimes retaining their structure so perfectly as to enable us to ascertain the kind of wood to which they belonged. These appearances are best seen in the coarser and more impure coals; in the purest, the vegetable matter is reduced, by chemical change and pressure, to an almost homogeneous mass.

At the commencement of the section, Dr. Dawson found a soil, four feet in depth, supporting a layer of vegetable mould which had been compressed into half an inch of coal; above the coal rested a dark-coloured limestone, filled with innumerable little shells of the *cypris*—the modern representatives of which reside in countless numbers in ponds and river estuaries. The bog, then, from subsidence, had become a pond or lagune, in which cyprides and other aquatic animals must have existed for some time, to form two inches of hard bituminous limestones. The lagune was dried up, and on the rich marly soil grew another forest; and the result was a thicker seam of coal, which in its turn was inundated and covered by a considerable thickness of shales and bituminous limestones, in which are perceptible the cypris and the scales of small fishes, bivalved, *modiolae* allied to the common mussel, and a small whorled shell, *spirorbis*. These limestones alternate with shales, indicating irruptions of mud. In the highest of these beds, which probably had become a swamp, trees took root which in time were buried by an irruption of sand, in which they, and an undergrowth of *calamites*, still stand in an erect position.

Time will not permit us to enter more fully into the subject. So refering you to the "Acadian Geology" for further details of much interest, I can only here say the whole series of the Joggins furnish repetitions of the facts already given; and a short history of one group will suffice to give an idea of the successive changes which have

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produced the whole section. As to the time required for the production of such vast deposits, it must have been so great that some have not ventured to define it: Sir Charles Lyell estimates it from three hundred and fifty thousand to two millions of years. Here is the history of the groups:—First, there was deposited under the water a stratum of clay, which from the withdrawal of the water or the emergence of the solid bed, became a soil suitable for the support of vegetable life. Here grew the sigillaria, a tall branchless tree, whose trunk was covered with a thick, smooth, and very indestructible bark, ribbed and regularly clothed with long, flat, dependent leaves, reaching a height of forty feet. They grew in dense groves and many species have been discovered. Under the sigillaria grew a thick growth of *poacites*,—plants with long striated leaves, six inches broad and three feet long, like gigantic iris plants. There were, also, probably several varieties of ferns, of which two hundred and fifty species have been found; many of them strikingly tree ferns. In process of time a peaty bog was formed. On this peaty soil grew trees, supposed to be coniferous *lepidodendra*, of which forty specimens have been found; but, in the present instance, now only represented by a stump of mineral charcoal, which, being about one foot in diameter, probably required for its growth about fifty years;—these trees were killed by the inundation of the bog. During their decay sigillariæ again sprung up to the diameter of two feet, when they were in turn overwhelmed by sediment, which buried their roots to the depth of about eighteen inches. At this level, calamites attaining the diameter of four inches, and sigillariae one foot, again grew. These plants were again embedded in a somewhat coarser sediment, but so gradually that sigillariae grew at two higher levels, before the accumulation of mud and sand attained the depth of nine feet, at which depth the original large sigillariae that had grown immediately over the clay, were broken off, and their hollow trunks filled with sand. Before being filled with sand, these hollow stumps must have projected from a swamp

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or terrestrial surface; as in them were found remains of reptiles and land shells, as well as many fragments of calamites, poacites and lepidostrobus, evidently introduced before the sedimentary matter. In one of these Sir C. Lyell and Dr. Dawson found the jawbone, containing teeth, of an animal called "Dendrerpeton Acadianum," and the shell of a land snail (pupa?) The remaining beds of this group give evidence of the condition of swamp for a long time after trees last noticed were completely buried. They include, in a thickness of twenty-eight feet, three underclays supporting coaly beds, and one with erect stumps. One of the coaly beds, which alternates with laminae of shale, is filled with flattened trunks of sigillaria and lepidodendron, indicating how small a thickness of coaly matter may mark the time required for the growth and decay of many successive forests.

The whole series of events recorded in the Joggins, indicate "gradual and long-continued subsidence, with occasional elevatory movements, going on in an extensive alluvial tract teeming with vegetable life, and receiving large supplies of fine detrital matter. On the one hand, subsidence tended to restore the original dominion of the water: on the other hand, elevation, silting up, and vegetable and animal growth, built up successive surfaces of dry land. For a very long period these opposing forces were alternately victorious, without effecting any very decided or permanent conquest—but, in the end, the whole series was dislocated and upheaved by one grand convulsion; and thus we have been enabled to read how these successive systems were "founded, flourished and decayed."

We have remarked that, in the series, there were 76 beds of coal and 90 distinct stigmaria underclays; and that all the coals, except two, rest on stigmaria underclays; and that there are 16 underclays without coal. This is a very important observation, because, up to this discovery, it was believed that coal could not be formed without stigmariae; and I find that Sir C. Lyell has recor-

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ded that, according to Sir Henry de la Beche, the coal beds in South Wales all present one characteristic feature, in having each of them what is called its *underclays*. And Sir Wm. Logan first announced, in 1841, that they were regarded by the colliers of South Wales as an essential accompaniment of each of the one hundred seams of coal met with in their coal field.

Having shown how coal is supposed to be produced, I shall now speak of the discovery of the various mines now worked in British North America; and shall commence by giving an account of the Albion mine, at Pictou, Nova Scotia, it having been the earliest worked, and being, up to this date, the most important, both as regards the thickness and extent of the seam, and the quantity of coal which it has yielded.

As early as 1817 coal—the existence of which had been known to the aborigines—was discovered on the East River of Pictou, Nova Scotia, by the Rev. Dr. McGrigor, a Scotch immigrant, who used it for domestic purposes. It was also worked at the outcrop, for several years, by Adam Carr and Ralph Patrick, Scotch miners, and by the late Robert McKay, Esq., a native of the county. Mr. McKay was a young man of intelligence and enterprise, and entered into a contract with certain parties in Halifax to supply them with coal—then a very rare article in the Province. He engaged all his capital and credit, and during the winter succeeded in excavating about 200 chaldrons, which he unfortunately placed on the "interval" of the river, for the more convenient shipping in the spring; but on the breaking up of the ice, the flood swept away, or covered with mud, the whole of his wealth. Messrs. Carr & Patrick were more fortunate, and for several years continued to supply blacksmiths and a few others with coal, at *ten* shilling a chaldron.

In 1826 a monopoly of all the mines and minerals in Nova Scotia and Cape Breton was granted [illegible] e IV. to his brother, the Duke of York; who so [illegible] to Messrs. Rundell & Brydge of London, wh [illegible] company called "The General Mining Associat [illegible]

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in the same year commenced operations, under the superintendance of Mr. Richard Smith, an eminent English mining engineer, on the farm of Dr. McGrigor, which had been purchased by the Association. Operations were commenced on the largest scale and with all the appliances of modern science, and resulted in the development of coal seams far exceeding in thickness anything hitherto discovered in the old world. The coal measures of the Albion mines were found to consist of the same materials, and to contain many of the same fossils, as were subsequently found at the Joggins, already described; but they differ in the arrangement. Instead of a great number of thin beds of coal and bituminous shale, there are here a few beds of enormous thickness, as if the coal-forming process, so often interrupted at the Joggins, had been allowed to go on for a very long period without interruption. The sections of the Albion mines are not perfect; they show however, five or six seams of coal, and an immense thickness (800 feet) of black shales, with cypris and remains of ferns and other leaves. There are also *underclays* and ironstones abounding in stigmariae. The vertical thickness of the two large seams of coal—the *main* and deep seams—is 37½ feet and 22½ feet respectively. The main seam has been very extensively worked, and its outcrop can be traced for several miles; but it is remarkable that it bears its character as a seam of good coal only for a limited distance. And the measures were till lately supposed to be cut off to be the northward, by a line of disturbance running along the south side of an enormous bed of conglomerate, which succeeds these coal rocks in ascending order, or *apparently so*. The seams are not of equal quality; and the coal hitherto exported has been obtained chiefly from the upper part of the main seam, from twelve to nine feet of which are worked at the depth of 400 feet from the surface. The *deep* seam of coal, of excellent quality, lies 150 feet below the main seam. The General Mining Association also opened pits at Sydney and Bridge-port, or Lingan, Cape Breton; and at Joggins, in the county of Cumberland. They have met

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with several great disasters, but they have always risen superior to them. In 1832 they had got their works, at the Albion mines, in admirable working order, when an explosion of fire-damp occurred and fired the mine; and the superintendent turned the East River into the shaft before it was extinguished. The water was not pumped out in less than two years, and at an enormous expenditure. The trade which they had just established with the United States, was for a time seriously interrupted. Some ten years after, a second most serious explosion and fire took place ; which was extinguished by stopping the vents, and filling in earth some twenty or thirty feet into the main shaft. The fire was thus extinguished; but great damage was done to the works, which had to be abandoned for some time, and new shafts were in consequence sunk. At this time the demand for coal had so increased that it far exceeded the supply—notwithstanding which the Association threw every obstacle in the way of private enterprise; but public feeling, in oppostion to the monopoly, at length became so general and powerful that the Association had to yield. Under their charter, they had to pay a fixed royalty of £5000 sterling, and six pence per chaldron on every chaldron raised beyond a certain amount. It was agreed to give the Association the right of mining over two miles at Pictou, Sydney and Cumberland—the lines and courses of the areas to be at the option of the Association. The £5000 royalty was given up, and no more royalty per chaldron was to be exacted from it than from any new companies that might be formed.

In 1851, the coal shipped or raised by the General Association amounted to 59,574 chaldrons, or a little over 89,000 tons. Now to show the great stimulus that was given to mining operations, by abolishing the monopoly, we will compare the return of 1860 with that of 1851. We find that in 1860 there were raised 172,947 tons, of the value of £85,682 sterling—61,725 tons of which were shipped to the United States. I shall make one further statement. Returns presented to the Legislature at the

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Session of 1864, shew that there were raised in 1863, 429,321 tons *from twenty-two mines;* 286,758 tons of which were shipped to the United States, 65,773 to the Colonies, and 72,758 tons were consumed in the Province I may also mention that, out of 397,608 tons raised in 1862, no less than 325, 111 tons were raised and shipped by the Association; thus falsifying all their predictions as to the ruin which would overtake them should the monopoly be abolished. In the three first quarters of 1864, there were raised 406,699 tons from 24 mines, and I believe the year's return fell little short of 500,000 tons. The demand has increased with the supply; and 1865 would have shown at least as large a return as 1864, but for the falling in of the Dalhousie pit at the Albion mines.

There is another very important fact which must not be overlooked. The General Mining Association, in laying off their two-mile area at Albion mines, influenced by the general belief of geologists, that the bed of conglomerate cut off the coal measure to the north, *made that bed their northern line.* To their surprise, a twelve-feet seam of very superior coal, called the Fraser Mine, was discovered almost immediately to the north of the conglomerate; and the works are in progress to develop it extensively, under the name of the "Acadia Mine," by a company, of whom Mr. Hugh Allan of Montreal, and Mr. Cyrus Field of New York, are prominent members. Again: a few months ago, almost adjoining the Acadia mine, another seam of 18 feet was discovered by Mr. French; and lastly, Mr. Campbell of Halifax, in an adjoining claim, and only eighteen feet below the surface, discovered a seam of pure coal 25 feet thick; a sample of which I here produce. Perhaps nothing in the history of coal mines [illegible] equal this seam of coal. It has been discovered, [illegible] opportune time—just as the Dalhousie pit [illegible] and the General Mining Association were [illegible] the demand; and, to complete the good [illegible] discoverer, when Government had determined [illegible] truct the unfinished portion of the Halifax [illegible] Railway, within a most convenient distance of [illegible] very.

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The Pictou coals are bituminous—yielding a large quantity of gas, but likewise a large quantity of ash. They are well suited for steam, gas and iron works. The texture is laminated, and there is much mineral charcoal on the surface. Its specific gravity may be stated at 1.325, and a cubic foot weighs 82 lbs., rather less than 28 feet being equal to a ton of coal.

The Sydney coal is more highly bituminous than that of Pictou, but contains a very large quantity of sulphur, which unfits it for smelting; and it is objectionable as a steam coal, from its formation of clinkers and its speedy destruction of furnaces and boilers. It is a very excellent domestic coal, leaving little ash, but producing much smoke, quickly fouling chimneys.

The Spring-Hill mine, at the Joggins, consists of a seam of three feet six inches and one foot six inches, separated by a clay of a few inches. It is a fair, free-burning bituminous coal.

The fixed price of the coal, delivered on board ship at the wharves of the General-Mining Association, is $2.50 per ton of 2240 lbs.

The other mines now worked yield coal of very different qualities; but all may be pronounced good bituminous coals. No anthracite has yet been discovered; and, if geologists are to be relied on, there is little likelihood of any being found. But this account would be incomplete if I were to omit mention of the "Fraser" oil-coal mine, which was discovered in 1859, and which I visited in 1860.It is situated a short distance north of the Albion mine and the conglomerate, and consists of two seams —one four feet and the other eighteen inches thick. The dip enables it to be worked on the inclined plane. Seventy yards down the incline a seam of bituminous coal commences, one and a half inches thick. The oil-coal occupies a position within the true coal measure. One ton yields 7 gallons of crude oil, and, near the outcrop, 200 gallons. 2400 chaldrons were raised during the year 1859, and sold at the wharf at $9 per ton. But the discovery of the oil-wells in Pennsylvania and Canada, made competition

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hopeless, and the works have been stopped. I must here note for reference hereafter, when I come to speak of the deposit at Hillsborough, in Albert county, New Brunswick, that the Fraser mine is found geologically *far above* the Albert oil-coal *seam*. The importance of this fact can only be appreciated when we come to consider the theory of the origin of oil and common coals: the common coals being considered to have their origin in the destruction of land plants, and petroleum from marine plants. Time will not permit us to dwell longer on the coal-fields of Nova Scotia. I must, therefore, direct your attention to those of New Brunswick.

It will be unnecessary to say anything further on the common coal formation, as that has already been pretty well discussed in connexion with Nova Scotia coal. So I shall at once bring under your notice the Albert mine, in Albert county, New Brunswick—a substance at one time considered so peculiar, that one-half of the scientific world pronounced it coal, and again petroleum; and ended by saying, that it was neither one nor other, but "*Albertite*." This locality was visited and carefully examined as late as 1863, by Professor Bailley, of Fredericton, New Brunswick, whose official report I shall refer to; it has also been visited, during the past summer, by Professor Hind, of Toronto, and it is necessary that his views should not be overlooked.

Professor Bailley first visited the Albert coal mines, and he thus speaks of them:—"So singular is their history—so lengthy are the reports and disputes concerning the true nature and position of the coal, and so extensive are their operations—that I cannot, however, for the general interest of the Province, refrain from referring to the extensive operations now conducted on the spot, as illustrating what a fair amount of energy and perseverance may do in overcoming apparently insurmountable difficulties in mining operations." The discovery was made in 1849; but, from the conflicting accounts given by geologists of the geological relations and chemical character of the coal, the capitalists of New Brunswick held

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aloof from investing in what was pronounced an "uncertain and hazardous undertaking." Why it should have been so pronounced can be readily understood by reference to the trial, "Gesner *vs.* The Halifax Gas Co.," before Judge Wilmot, in 1852.

On referring to the Judge's minutes, it will be found that nearly the whole scientific world of America, and to some extent of England also, was employed in the determination of the vexed question. The witnesses for the Plaintiff swore:—That there was an anticlinal basis; that it was a vein, not a bed; an injected mass thrown up—strata distorted. No conglomerate above and below; no parallel strata of coal beds; no roof; no floor; no fire clay no coal fossils; *and lies beneath coal formation.* Amorphous; no vegetable structure; no cellular tissue; no lamination; and transmits light.

The Defendant's evidence was:—That there was *no* anticlinal axis; is a bed, not a vein; a deposit, and not an injected mass; strata parallel; has roof, fire clay, and coal fossils; and is just where it ought to be, in the coal series above the old red sandstone—and it would be a miracle if a coal bed were not there; has indications of vegetable structure; distinct laminations, &c., &c.

Then, as to its properties, the evidence of Plaintiff showed:—That it was fusible, melted by heat, and is the same after being melted as before; is soluble in coal-tar, in turpentine, in naphtha, and in other menstrua. The Defendant proved:—That it would not melt without changing its character, by throwing off gas. Every known variety of asphaltum melts at not exceeding 250, and, after cooling, can he melted again. Known asphaltum softens in the sun: sun has no effect on this. When apparently dissolved in coal-tar, it is not dissolved, but only held in mechanical suspension.

Hear, now, what Professor Bailley writes in 1863:—"I call the substance coal, although in the vicinity generally known by the name of shale . According to the statements of Dr. Robb, it is neither a shale nor a schist; but a true cannel coal, having all the characteristic pro-

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perties of the substance to which that name is given in other localities. Openings have been made upon six different strata, and coal has been removed from them to the extent of 1,000 tons. I descended one of these openings, and found the coal to form a distinct stratum, about four feet in thickness, about ten feet from the surface. In descending, the bed rapidly increases in thickness and purity. The walls are composed of highly bituminous shale, emitting considerable odor. The shales and coal are perfectly conformable— the coal being a true *stratum*, and not a mere *deposit*, like some portions of the Albert coal."

"The unweathered coal is dark-black, and unlike the true Albertite, entirely lustreless. It admits, however, of a fine polish; and beautiful ornament objects might readily be cut or turned out of it, its color being little inferior to jet. It is not at all brittle, like Albert coal; but, on the contrary, rather tough, breaking with a large conchoidal fracture. It is nearly homogeneous in character; but occasionally contains irregular seams and masses of a brightly-shining and brilliant coal, apparently identical with true Albertite. Il is very hard and heavy, containing so much volatile matter as to allow of being readily ignited by the flame of a match or candle." Taking an average of the beds yet opened, their thickness would be from two to seven feet, and one of these beds is said to outcrop on the very summit of Baltimore mountain. These seams were at one time worked quite extensively, and distilled into oil, at the 'Caledonia works.' When Mr. Bailley visited them they were lying idle—probably from the same cause as led to the abandonment of the 'Fraser mine,' near Albion mines, Pictou. "There can be no doubt," says Professor Bailley, "that the supply of coal in the vicinity of these oil works is very great, and its quality excellent." In a foot-note, the Professor says:—"At the time of the celebrated controversy upon the nature of the Albert coal, this fact was one of much importance. One party contended that the Albertite was a *mere deposit*—and hence not *coal*, but *asphalt*, the other, that it occurred in true strata of the coal measures, and was really a

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highly bituminous coal. The latter is undoubtedly the correct view; yet Mr. Byers informs me that, while in some portions of the mines the coal is in beds, *conformable with the natural stratification; in others it is directly at right angles with it.*"

Returning again to the 'Albert mine,' at Hillsborough —and which is not to be confounded with the Caledonia oil-coal mine, from which it is about eight miles distant— we find that this mine, pronounced at first utterly valuless, is every day becoming more extensive. "It was at one time thought that the supply of coal would soon become exhausted; and hesitation was evinced as to the propriety of erecting expensive machinery over a mine which might at any moment cease to be of value. This uncertainty arose from the fact, that the distribution of the coal does not seem to follow the same laws which are generally observed in coal-mining districts; and frequenly when a level is being worked in a particular direction, the supply is found suddenly to fail. This is, of course, partly due to *faults;* but not entirely so, as in many cases the coal shows no conformability with the inclosing rock. It has been found, however, that, in such cases, beds may be readily found after a little drifting; and the proprietors have now no hesitation in urging on other works. The coal is of a perfectly uniform character wherever found, there being no division possible into various qualities; and all commands the same commercial value." A valuable lesson may be drawn from this: twelve years ago, everybody seemed unwilling to engage in the enterprise; now steam-engines (one of 400 horse-power) are at work, and in 1863 above 16,000 chaldrons were raised; and, according to Professor Hind, since the opening of the mine 170,000 tons have been raised, of the value of $10 per ton.

Professor Hind visited the Albert mine in October, 1864. He descended the mine to the depth of 750 feet. He thinks the relation of the Albertite to the adjacent rock *absolutely undefined;* and says: *sometimes,* but rarely, the strata are parallel to the veins; sometimes, and generally, inclined to it, at a greater or less angle; and

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sometimes they butt end on; and not unfrequently, for some hundred feet, the strata are inclined, at different angles, to the vein at opposite sides. In fact, there are numerous dislocations,and in one dislocation the vein overlaps by many feet, and passes beyond the vein in another dislocation; and, from this fact alone, he believes that the *vein is not a bed.* He says, the evidence is now conclusive that the Albertite has been injected into an irregular fissure, in a liquid or soft state, under great pressure; so as not only to fill the fissure but to force itself into all the minor cracks in the rock subordinate to the main fissure. Professor Hind thinks that Professor Bailley, in asserting that it is coal, gives no reason for his opinion; and says;—"If it were coal, the mode of its occurence would be directly opposed to the views of geologists respecting the nature, origin and disposition of coal; and no sound advice could be given towards prosecuting a search for it in any direction." I may here remind you that, guided by the views of experienced geologists and practical miners, the agents of the General Mining Association selected their area south of the line of conglomerate, which was supposed to have cut off the coal seams to the north. The new adventurers, not having the fear of geologists before their eyes, discovered invaluable mines where geology had pronounced it was improbable they would be found.

Professor Hind believes Albertite to be an inspissated or hardened petroleum, and that its source lies below the Albert shales, among rocks of the Devonian age; though he admits that recent enquiries have established the fact that petroleum is not only very widely diffused, but is not, as was generally supposed, confined to rocks of a certain geological age—but that it occurs in rocks of all ages, and often in different mineral states or conditions. Naphtha, petroleum, rock oil, asphalt and mineral pitch, are all forms of bitumen.

In reference to the Albert or Baltimore shales, formerly worked by the 'Caledonia Oil Co.,' Professor Hind says, he counted, in an inch, upwards of a hundred of very thin alternate layers of stratified calcareous mud and bitumen,

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and that this bitumen differed from the Albertite; and that they appeared to be the uppermost beds of the formation, and to contain a much larger amount of bitumen—a ton yielding from sixty to ninety gallons of crude oil; and they seem to have been formed in a shallow, tranquil, tidal estuary, into which springs of petroleum were discharging themselves. They must not be mistaken for the 'oil shale,' or 'oil coal,' of the Fraser mine, in Nova Scotia, which lies geologically far above the Albert shales, and occupies a position within the true coal measures; nor with the earthy bitumens which are found within the same geological limits. These oil-coals and earthy bitumens of the coal measures are thought by Dr. Dawson (than whom a better authority on this subject does not exist) to be "a water-soaked vegetable soil, completely bitumenized and twisted and slickensided, owing to the giving way, under pressure, of the roots and trunks under which it was interlaced." Mr. Henry Poole describes it as 'a substance of shaly aspect, laminated and slickensided, and the laminae much twisted, causing it to be distinguished as *curly* oil-coal. This bed varies from two to twenty inches in thickness. Under it is a bed called 'oil shale,' about two feet thick, and containing ganoid scales, lepidodendron and cordaites. Below this are argillaceous shales, abounding in cypris and spirorbis".

Professor Hind has no doubt that the Albertite is of Devonian or prior origin, and proceeds from rocks of the same age as those which yield the petroleum of Pennsylvania, Ohio and Canada; and says:—"Recently some remarkable discoveries of bitumens in many different stages, from petroleum to Albertite, have been made in the West India Island;" and he quotes Dr. Sterry Hunt, as follows:—"We do not know the precise conditions which, in certain strata, favor the production of petroleum, rather than of lignite or coal; but in the fermentation of sugar—to which we may compare the transformations of woody fibre—we find that, under different conditions, it may yield either alcohol and carbonic acid, or butyric and carbonic acids, with hydrogen. These ana-

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logies furnish suggestions which may lead to a satisfactory explanation of the peculiar transformation by which, in certain sedimentary strata, organic matters have been converted into bitumen."

ProfessorHind also says:—"The altered character of the slates underlying the carboniferous system in the deep indent from Dorchester to Sussex, does not militate against the supposition, that the rocks to which these slates belong are the source of the petroleum; for it is well known that the metamorphosis produced by intrusive rock is generally confined to within a few yards of the intrusive mass". The petroleum springs in Albert and Westmoreland, which probably come from the underlying Devonian rocks, show that metamorphic action has not there changed in the least degree the character of the fluid; one of these springs being within five miles of the Albert mine, and within less than a mile of Albertite in place.

Albertite in position has been discovered in six different localities. Fifteen miles from Sussex Vale, in metamorphic slate. The Humboldt mine, in King's county, has a small vein running through metamorphic slate rocks In all other places, with this exception, the Albertite has been found in shales, sandstones, conglomerates, or limestones, of the lower carboniferous series. In the Humboldt mine no trace of shale is found; but the conglomerate and drift are impregnated and cemented together with bitumen.

British Columbia.

Coal crops out towards the coast of British Columbia, and has attracted some attention; and outcrops occur at several points of the eastern coast of Vancouver's Island; and the Hudson's Bay Company have made several attempts to turn this to profitable account. Works were commenced at Beaver Harbour in 1849; but were soon abandoned. Extensive seams of workable coal were subsequently discovered at Nanaimo, sixty miles north of Victoria, by Mr. Joseph McKay, in 1850. The same seam was found on Newscastle Island, and several other small

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islands in the channel; and the Indians got out 200 tons. At Nanaimo, a shaft to the depth of fifty feet was sunk by regular miners, and a vein to the depth of seven feet thick was found lying on conglomerate. Eight miners were able to raise 120 tons per week. The pit is within a few yards of the water, and vessels drawing sixteen feet can anchor close to it. It is believed that coal may be found anywhere within a circumference of two miles, at a depth not exceeding sixty feet. About 6,000 tons have been raised—one-half by Indians. The great importance of this mine will be understood, when it is stated that not less than 200,000 tons of coal are required for the consumption of the Pacific steamboats; all of which had to be carried from Europe, or from the Albion mines, at Pictou, Nova Scotia.

CANADA.

I now come to the consideration of the question:—Has coal been discovered, or is it likely to be discovered, in Canada? And as reference has been so frequently made to Sir William Logan's opinions, and as he is undoubtedly the highest authority to whom we can appeal, I shall at once give Sir William's own words, as we have them under the head "coal," in Geology of Canada:—"The black bituminous shales or pyroschists of the Portage and Chemung groups, contain the remains of terrestrial plants, including a species of calamites, the flattened stems of which are sometimes found to be converted into coal." The Portage and Chemung group are of the higher members of the Devonian series; and their shales contain so much organic matter, as to take fire and burn with flame, after which the color is changed to brick-red. The higher portions of the Devonian, at Gaspé, abound, in some portions, with similar remains of carbonized plants; and in the lower part of the Gaspé sandstones *there is a well-defined seam of coal,* with carbonaceous shale, measuring three inches, and *having beneath it a bed of clay holding the roots of plants.* The section of these sandstones, given on page 394, shews that a terrestrial vegetation prevailed throughout the whole series; yet in no other part of the thickness of 7,000 feet was there observed a distinct

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coal seam. The same upper Devonian strata, in the state of New York, contain in like manner thin seams of coal, which are of no economic importance. The rocks of the Bonaventure formation, in Gaspé—*the only representatives in Canada of the true coal-bearing series*—have afforded nothing but a few carbonized plants."

Under the head "Carbonaceous Minerals," viz, liquid and solid bitumen, carburetted hydrogen gas, bituminous shales, coal and graphite, Sir William says, that graphite is common to the Laurentian and the *altered* palaeozoic rocks; but the others are not met with in the unaltered palaeozoic strata alone. Bituminous matter in the form of petroleum, or mineral coal, appears in many places in the limestones of the Trenton group, from the extreme west to Gaspé Basin, where is found a layer of mineral pitch, or dried bitumen, an inch in thickness, lying beneath the surface of vegetable mould; while the soil from some distance to the east is saturated with petroleum. In other locaties is also found bitumen, in the form of asphalt; and at Petrolia, in Enniskillen, a bed, from four to two inches thick, was met with at the depth of ten feet in the clay, and reposing upon four feet of gravel. This bitumen is readily separable into thin layers, soft and flexible, and shewing on their surface remains of leaves and insects, which had become imbedded in the bitumen during its slow accumulation and solidification. Sir William likewise says, that at Kincardine and Bertie the soluble and liquid bitumen of the corals becomes replaced by an insoluble carbonaceous matter, infusible, the result of the slow oxidization of the petroleum. "These observations seem to throw light upon the origin of a black, combustible, coal-like matter, which occurs in many places in the Quebec group, and has in different localities been mistaken for coal. In the Quebec group, which is regarded as the equivalent of the calciferous formation, this substance has been observed at Quebec, Orleans Island, Pointe Levis, Sillery, St. Nicolas, Lotbinière, Drummondville, Acton, at Gaspé, and many other places.

The black shales at Bear Creek, near Kingston Mills,

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Warwick, are inflammable, as in the case of similar shales of the Utica formation, "and have suggested to many persons the probability of beds of coal in the vicinity. Between these highest shales, however, and the horizon of the true coal measures in the southern peninsula of Michigan, where these measures are nearest, *there is wanting in Western Canada the remaining portion of the Portage and Chemung group.*" The epithet bituminous shales, or pyroschists, is not only applied to such as contain ready-formed bitumen, but to coals, shales, &c., which closely resemble bitumen in composition and properties, and from which petroleum can be produced by destructive distillation, as from lignite, peat, and even from wood; "and it is probable that some of the strata of the Quebec group, as well *the black shales at its base,* are *pyroschists;* for the altered rocks of this series are, in many places, very carbonaceous, and contain an admixture of plumbago".

Bitumens have been supposed to owe their origin to the action of heat on coal, and similiar organic matters, by slow distillation; but it is objected that they occur in rocks in which there is no evidence of the action of heat, as at Bertie, where bitumen has been generated in the porous rocks, where it is now found; and "in the palaeozoic rocks of North America, bitumen must be derived, either from a marine vegetation, or the remains of marine animals, the lower forms of which differ but little in elementary composition from plants, and may as readily yield bitumen; and the transformation, by which organic matters may be converted into bitumen, does not differ very greatly from that which produces the more bituminous coals, to some of which certain of the asphaltums approach very closely in composition."

The bitumen of Trinidad is in the tertiary system, and associated with beds of lignite, and confined to particular strata once containing vegetable remains, which, according to Mr. Wall, have undergone a *special mineralization,* producing bituminous matter, instead of coal or lignite. Vegetable matter, whether of marine or terrestrial origin,

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may be changed into petroleun, lignite, or coal; but it is very likely that an accumulation of molluscous animals, in certain strata, may from subaqueous decomposition, have given rise to the petroleum found in the coral rocks or palaeozoic limestones of Canada.

From these quotations, I do not think we would be justified in asserting that Sir William Logan has entertained the dogma that coal did not exist, and consequently could not be found, in Canada. True it is, he has said that the Bonaventure formation—which he considers the only representatives of the carboniferous systems in Canada—has only afforded a few carbonized plants; but discovery, even at Bonaventure, is not exhausted; and, from the facts which I have furnished in connexion with coal or coal-like substances in British North America, I do not think that Sir William would assert the impossibility of finding coal in Canada in quantity to be of economic value; though up to 1862—the date of the publication of the Geology of Canada—he might have thought it improbable.

I have now got pretty well through my subject; and trust I have arrived at the point from whence I can introduce, intelligently and intelligibly, the facts in connexion with the discovery of the coal-like substance at Pointe Levis, and which have led to the preparation of this paper.

On hearing that coal had been found at Fort No.3, Point Levis, I took the earliest opportunity of visiting the spot, as from the rumours that were abroad, I thought it not impossible that a discovery of some value had been made. I first went to the smithy, where I had been told it had been in use for the last few weeks. I saw in the coal bin about twelve bushels of what I at first thought was ordinary blacksmith's coal, but which the smith told me had been taken from the excavations for the fort. On a more close inspection I thought I had seen coal which really did not appear more genuine than that which I held in my hand, only it was much lighter than ordinary coal. The smith informed me that he had been using it, and nothing else, for the last twenty days,

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and that it answered equally as well as the Newcastle coal, which he had previously used, but that it burnt away more rapidly. It was easily lit, and when covered up at twelve o'clock, only required the blast of the bellows to bring it into a glow again, when work was resumed after dinner, at 1 p.m. It left little ash, and formed a light clinker.

I then visited the works, where I met Mr. Gunn, the overseer, who obligingly accompanied me to the vein or stratum, or I should rather say veins, for they were three in number, running parallel to each other, within a width of four feet, and being *conformable* with the strata of shale. The seams were of unequal width, the centre, being the largest was in some parts between ten and twelve inches thick, narrowing, both upwards and downwards, to a couple of inches; the two lateral seams in no part exceeded three inches in width. The dip of the slaty shale, with which they lie conformably, is to the south, at an angle not exceeding nine degrees. The seams have been met with, more or less regularly, running towards the east, about forty-five feet. On a subsequent visit, I inspected another small seam, about two inches in width, situated about ninety yards eastward of the first discovered seams. I looked upon this carbonaceous matter as nearly answering the description which Sir William Logan has given of the "altered bitumen formerly found in many places of the Quebec group, and which was first described by Vaunuxem, in the Geology of New York, under the name of *anthracite*, as occurring in the calciferous formation, with crystals of bitter spar and quartz (our Cape diamonds) having been introduced into the cavity, in a liquid state, and subsequently hardened, showing, by its having conformed, that it was once in a plastic state. Very pulverulent, brittle, of a shining black, and, according to Vaunuxem, yielding but a small amount of ash. The volatile matter given off from different specimens varied much; that from Mountain Hill, Quebec, equalled 19.5 per cent.; that from the Island of Orleans 21.0; that from StFlavien 15.8; and another 24.5. But then Sir William also had said: "It fills fissures several inches

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in diameter, so that it has been mistaken for coal, and attempts have been made to work it at Quebec and elsewhere. The mineral, however, is *never in true beds like coal*, but is always confined to veins and fissures, *which cut the strata*, shewing its deposition to have been posterior to the formation of the rocks."

Being anxious to have the opinion of Dr. Dawson, who, I was aware, was well acquainted with the Hillsborough mine, I forwarded him specimens, and gave expression to my opinion. Dr. Dawson very soon favoured me with a reply, which I was pleased to find accorded with my own expressed views. I give that portion of his letter bearing on the subject:—It is evidently the sort of altered bitumen which Sir William Logan refers to; and furnishes a curious illustration of the manner in which a substance resembling coal may originate in a quite different way from the ordinary one. It is likely that the deposit may be quite limited in extent; but this is not certain, and should not be taken for granted. The profitable working of the *Albertite* in New Brunswick, under circumstances very different from those of ordinary coal, shows that the most unlikely things are possible in such matters."

Analysis.—Two lumps of this coal, weighing 4 oz. 1 drm., taken indiscriminately from a keg, were put into a crucible, and placed in an open grate. When the crucible became red hot, one of the pieces softened, and swelled like a good bituminous coal; the other piece, which was harder and heavier, and evidently contained more earthy matter, swelled very little, but cracked and fell to pieces very slowly. The first piece gave out a large quantity of gas, the second less, which, mingling in the upper part of the crucible, broke into a flame, which burnt brilliantly for some minutes. The first piece left a small quantity of fine-ish cinericious ash; the second a large quantity of a brownish shaly matter. On weighing the solid product it was found to weigh 1 oz. and 15 drachms, having parted with 2½oz of gaseous matter, or nearly two-thirds of original v

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The crucible was then filled about one-third of its capacity with the finer part of the coal, which, when the crucible became red hot, swelled out, occupying another third, and for about half an hour yielding gas, which became ignited, and filled all the upper portion of the crucible. I here produce the cinder produced, which you will observe is light and porous, and has assumed the form of the interior of the crucible.

In conclusion, let me give the deductions which I have drawn from the various facts which I have submitted:—

First,—I think it has been proved that carboniferous matter pervades rocks not included in the carboniferous system of Geologists, and that, owing to special circumstances, the matter may be presented to us as Petroleum, Asphalt, Altered Bitumen, Lignite and Coal, varying from an earthy bituminous shale coal, to one so highly bituminous as to be with difficulty distinguished from pure asphalt.

Second,—That the productions of the mines of Europe, as well as Nova Scotia, which have generally been recognized as coals, owe their origin to the accumulation and decay, or change of *terrestrial* vegetable matter, from growth *in situ,* chiefly of sigillariae, calamites, poacites lepidodendron and ulodendron, as is so clearly illustrated in the section of the Joggins; or from drift formations, such as are now in progress, at the delta of the Mississippi, and other great rivers.

Third,—As a general rule, where coal owes its origin to terrestrial vegetable growth *in situ,* it is underlaid by a stigmaria clay; but that it may be generated without the stigmaria clay, as demonstrated by the two coal seams at the Joggins.

Fourth,—That oil coal, the production of terrestrial vegetation, may be generated in the true coal measures, as in the case of the "Fraser Oil Coal Mine," at Pictou, and the "Albert" deposit at Hillsborough, N.B., which Dr. Dawson pronounces "a fresh water formation of the *lower carboniferous period*", though Professor Hind views it as produced and injected from *beneath* the lower carboniferous series, from rocks of the Devonian, or prior origin.

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Fifth,—That oil coal, the production of marine, vegetable, or animal organic remains, may occur in rocks of almost any geological age; and that it may present itself in fissures, *cutting* the strata below which it may have been generated, or that it may occur as a *horizontal* bed, originally poured out over the bottom of a lake, or of a shallow, tranquil, tidal, estuary, and hardened and covered up by sand and clay deposits of the carboniferous age.

Sixth,—That various instances cited show that petroleum generated from the destruction of marine, animal and vegetable life in the strata of the great palaeozic basin of British North America, at several different geological horizons, may, by oxidation and volatization, be slowly changed into asphalt, or mineral pitch, by a continuance of the same action, may be converted into a coal-like matter.*

Seventh,—That at the base of the lower silurian rocks in Canada (the Quebec group) a black, combustible, coal-like substance has been found in several places, and that comparing the conditions under which it has been discovered at Point Levis with those existing at Hillsborough, it is neither impossible nor improbable that *coal*, or a substance possessing many of its most valuable properties, may be yet found, in sufficient quantity to make it of great economic importance.

And Eighth,—That the facts cited in connection with the Hillsborough mine, in New Brunswick, and still more recently with the operations in the vicinity of the Albion mines, Pictou, N.S., show that the most eminent Geologists, and most experienced practical miners, may seriously err, and that it is not always safe to rely on their opinions and predictions in the prosecution of mining enterprise.

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*To enable us to form some idea of the enormous secretion of petroleum, it is only necessary to refer to the quantity yielded by the Oil Springs of North America, a discovery of yesterday. It is estimated that 500,000,000 gallons of crude oil have been produced, including 50,000,000 from the Springs of Canada.

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NOTE.

SPECIMENS OF COAL EXHIBITED TO THE SOCIETY.

First:

1st. Brown.—Boghead; cannel coal.

2nd. Grey Black.—Lesmahago; cannel coal.

Qualities:—Hard, non-lustrous, highly bituminous, homogeneous, and admirable gas producers. They are found in the Secondary series, in the true coal measures, and their seams sometimes run into common bituminous coal; and fossils of sigillariae, and other plants of the true coal measures, are found in them. The "oil-coal" of the Fraser mine, at Pictou, Nova Scotia, and the "Albertite," at Hillsborough, New Brunswick, are similar to the lesmahago, and are situated in the true coal measures.

The Baron Von Buck considers the brown coals of Germany, of the miocene formation, to afford no intrinsic evidence of their age, as they are composed of fragments, or mere leaves, without flowers or fruit. The brown coal of Radabog, on the confines of Styria, is covered by strata containing marine shells, itself contains cones, leaves and wood of coniferous trees, and fragments of trees of the laurel and platainis tribes.

At Bonn and Cologne, the brown coal, or lignite, is of various ages—eocene, miocene and pliocene; and countains only one fossil, very like a cocoa-nut.

In 1851, the Duke of Argyle disscovered, in the Isle of Mull, in the tertiary strata, three leaf-beds, each from 1½ to 2½ feet thick, interstratified with volcanic tuff. The leaves belong to plants not now indigenous to the British Isles

Dr. Dawson discovered, at River Inhabitants, Nova Scotia, under the boulder clay, and superimposed on grey clay, a hardened peaty bed, nearly as hard as coal, but tougher and more earthy, containing many small roots and branches of coniferous trees, having a glossy appearance, approaching the brown coals in quality, and burning with a considerable flame.

Second:

1st. Dry cubical.

2nd. Fat cubical.

The ordinary domestic English and Scotch coals—composed of carbon, oxygen, and nitrogen, and the quality depending on their relative proportions.

Third:

Anthracites.—1st American Lehigh—black, hard and lustrous. In 1841, Sir C. Lyell saw at "Mauch Chunk." Lehigh, a seam between forty and fifty feet thick, from which coal was quarried in the open air—the overlying sandstone forty feet in thickness, having been removed bodily. This vast deposit, unmixed with earthy ingredients, Sir C. Lyell considers the result of the growth, during thousands of years, of trees and ferns after the manner of peat, subsequently condensed by pressure, and by the discharge of its hydrogen, oxygen, and other volatile ingredients.

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2nd. Welch or steam anthracite—rather more bituminous than the Lehigh.

3rd. Scotch or blind anthracite—very similar to the Welch. The Scotch miners consider this coal to be bituminous coal, changed by the superimposition of trap; and in searching for anthracite always look first for the trap. The best anthracite has only from 6. to 11% ash; the less pure, as much as from 40. to 50. The characteristics of anthracite, whether splint, glance, hard, or culm, are great heat, little smoke, and little ash, on combustion.

Fourth:

Pyritous coal from Glace Bay, Cape Breton.

Fifth:

Coal or Altered Bitumen from the Palaeozoic rocks of Point Levi

N.B.—The Oolitic coal at Brora, Sutherlandshire, Scotland, affords the thickest stratum of pure vegetable matter hitherto discovered in any secondary rock in Britain. One seam of good quality, 3½ feet thick, has been worked, and there are resting upon it several feet more of pyritous coal, of which I have seen cart loads in square blocks, which shone in the sun like burnished coal. Sir C. Lyell points out that in this neighbourhood common hypogene granite, in contact with Oolitic strata, has been elevated bodily, at a period subsequent to the depositions of these strata. The pyritous coals are all liable to spontaneous combustion.

Sir C. Lyell also describes an Oolitic coal near Richmond, Virginia, which occurs in a depression of granites, extending twenty-six miles, north and south, and four to twelve, east and west. The measure is composed of grits, sandstones, and shales, exactly resembling those of primary date, in America and Europe, which they surpass in richness and thickness of coal seams. Sir C. descended a shaft 800 feet, entered a chamber 40 feet high, formed by the removal of pure bituminous coal, exactly similar to the finest Newcastle: and it is worthy of remark that it has been derived from pure, zanites, calamites and equisetums, very distinct specifically, and in part generically, from those which contributed to the ancient palaeozoic coal.

Flora of the coal period.—About 500 species have been discovered; among them 250 ferns—the larger portion of European existing ferns—only some sixty in number being represented; but some are decidedly arborescent. Of the lepidodendron—a coniferous tree from forty to fifty feet in height—there are many species. Of sigillariae, 350 species, some of which were seventy feet in height. Also, numerous calamites, poacites, astrophylites, and equisetums.

Shells, &c.—Cypris, modiola, spirorbis, of fresh water. And, in England, fresh and marine shells intermingled, limuli, cytheres, micoconchus; several fishes of genus megalocthys and holoptychlus. Ont or more species of scorpions; two beetles of the family cucurlionidae; an insect resembling the genus corydalis, and another the phasmrdae, in Coalbrookdale. Several specimens of cockroach, and the wing of a cricket, in the coal of Wetting, in Westphalia; and twelve species of insects— blattinas, neuroptera, scarabaeus, a grasshopper or locust, gryllacris, and several white ants or termites, in the nodular iron-clay of Soarbouck, near Treves. Lately, also, a spider has been found in the coal seams of the palaeozoic period.

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PAPER III.—ON THE HISTORY OF LITERATURE.

BY JAMES M. LEMOINE, ESQ., VICE-PRESIDENT.

(Read before the Society, Dec. 6th, 1865.)

Monsieur le Président,

Invité à faire, ce soir, sans avoir eu le temps de m'y préparer convenablement, les frais d'une *Causerie Littéraire*, j'ai cru pouvoir faciliter ma tache en choisissant un sujet qui va droit au cœur de la majorité de ceux qui m'entourent. Jetant un coup d'oeil sur le passé, je suis allé remuer les souvenirs littéraires qui nous sont communs à nous tous, membres de cette société. Je suis entré dans le champ des lettres y glaner quelques épis dorés; puis, pour me servir d'une figure dans le goût de notre collègue, M. Anderson, notre infatigable botaniste, je suis allé herboriser parmi les mousses et les fougères de l'Hélicon, pour y ramasser quelques modestes fleurs des bois, mais des plus aromatiques: fleurs et épis, j'ai beaucoup de plaisir à vous en tresser une guirlande et à la déposer à vos pieds.

C'est l'éloge des lettres que j'ai à vous présenter. En faire l'histoire, n'est-ce pas en faire l'éloge? Le mandat est attrayant: pour moi, c'est un travail d'amour, car, avec plusieurs de ceux dont la présence m'honore ce soir, n'ai-je pas, pour employer un mot pittoresque de Montaigne, "cotoyé les routes gazonnées et doux fleurantes," de la science dans le vieux Lycée à deux pas d'ici, que son illustre fondateur, l'évêque de Petrée, aurait bien de la peine à reconnaitre, s'il lui était donné de revisiter ces lieux, tant il s'est agrandi;—l'arbuste de 1663 est maintenant un chêne majestueux, portant fruits, plein de sève, et dont l'ombrage attend des générations à naître.

Oui, M. le président, les lettres ont obtenu le culte, ont conquis les hommages de toutes les nations: c'est leur patrimoine, leur gloire, leur propriété inaliénable. Re-

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montez la chaine des temps: à chaque pas, vous les trouvez les amies de l'humanité; partout des autels à Minerve, bienfaisante divinité descendue sur la terre, radieuse et vivace. Athènes, la savante, bâtit le Parthenon à l'entrée du Pirée, temple aussi superbe que ceux où se célébraient les mystères de Jupiter Tonnant: ainsi chez les Grecs, ces fils ainés de la science, le culte des muses allait de pair avec celui du maitre des Dieux. Les Romains, souverains du monde entier, envoyaient leur jeunesse la plus illustre à Athènes leur conquête,—hommage éclatant que ces farouches conquérants rendirent aux arts pacifiques.

Si je ne craignais de vous ennuyer d'une longue nomenclature, j'évoquerais ici les noms de tous les hommes illustres qui ont puisé dans la lecture des poêtes le sentiment de l'héroïsme qui a dicté leurs actions. Qui, par exemple, a jamais douté que la lecture de Plutarque ne fût propre à inspirer la fermeté dans les revers et l'amour passionné de la gloire. Quoique l'on donne aux sciences et aux arts pour symbole la branche d'olivier; quoique l'on tienne que rien n'est plus favorable à la culture des lettres que la paix, ce serait peut-être encore une question assez curieuse à examiner, de savoir si plusieurs des fameux généraux qui ont étonné les nations du bruit de leurs armes, n'ont pas acquis cet empire autant par leur éloquence à la tribune que par leur génie militaire. A ces mots de génie et de victoire, il nous semble voir surgir devant nous les grandes ombres des Péricles, des César, des Mahomet, des Cromwell, des Napoléon. Péricles, cet éloquent capitaine, qui comptait ses victoires par ses batailles; César, ce foudre de la puissance romaine qui combattait avec la même force qu'il écrivait, aussi fameux par ses *Commentaires* que par la conquête des Gaules et de la Germanie; Mahomet, ce terrible fanatique qui armé du glaive et de la parole, bouleversa la moitié de l'univers; Cromwell, qui en discourant du Pentateuque, des synodes et des écritures, forgeait un joug de fer à une nation jusqu'alors impatiente de tout frein; Napoléon, ce colosse des temps modernes, qui promenait ses aigles victorieuses "des bords du Tanais au sommet du Cédar," ce grand ravageur des

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nations qui distribuait des sceptres et des couronnes comme l'on donne des jouets à des enfants; l'homme de mystère, dont un mot enflammait l'ardeur de ses braves, ces invincibles grognards de la vieille garde. Veut-on savoir ce que pensait des lettres un des plus beaux génies de l'antiquité; eh bien! voici comme s'exprime le père de l'éloquence latine. C'est un éloge mille fois cité et qui néanmoins a toujours eu autant d'admirateurs que d'auditeurs. De plus, pour plusieurs d'entre nous, c'est une réminiscence de collège et souvent ce ne sont pas les moins agréables. *Forsan olim meminisse juvabit.*

"Quand, dit il, on n'envisagerait dans ces études que le plaisir, vous n'en regarderiez pas moins, je pense, cette récréation de l'esprit comme la plus digne d'un homme et d'un citoyen. En effet, les autres amusements ne sont ni de toutes les heures, ni de tous les âges, ni de tous les lieux. Mais les lettres nourrissent la jeunesse, réjouissent les vieillards; dans la prospérité, elles nous servent d'ornement; dans l'adversité, elles nous offrent un asile et une consolation. Elles nous recréent chez nous et ne nous gênent pas au dehors. Elles passent la nuit avec nous; elles voyagent avec nous; elles nous suivent à la campagne. Et quand nous ne pourrions y atteindre, ni goûter par nous-mêmes la douceur des lettres, nous devrions encore les admirer dans les autres."

Ou bien dans l'harmonieux idiôme d'André Chenier:

> "Beaux arts, O de la vie aimables enchanteurs
> Des plus sombres ennuis, riants consolateurs
> Amis sûrs dans la peine et constantes maîtresses
> Dont l'or n'achète pas l'amour et les caresses."

Les lettres ont donc de tout temps fait les délices du genre humain. L'adversité y a puisé du soulagement; la prospérité, l'amusement; vraie fontaine de Jouvence, véritable Lethée, elles sont ces fleuves mystérieux dont l'onde en rajeunissant, en ravivant la pensée, possède en outre le don de faire perdre le souvenir de ce que la

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vie a souvent d'amer et de sombre. Que de grands génies aux prises avec l'infortune, ont choisi les lettres pour consolateurs et pour confidents dans la solitude de leurs pensées? Silvio Pellico, au fond du noir donjon où les autorités de Venise l'avaient relégué, crayonnait ces pages éloquentes qui l'ont immortalisé. Socrates, le Tasse, Cervantes accordèrent leur lyre au son de leurs chaines et sûrent en tirer des accents jusqu'alors inconnus.

Galilée, "coupable d'avoir eu trop tôt raison," Galilée, dans les fers, prouvait au monde la royauté du génie qui tôt ou tard doit triompher de toutes les combinaisons des hommes: car le génie est roi et doit régner.

"Le Nil a vu sur ces rivages
De noirs habitants des déserts
Insulter par leurs cris sauvages
L'astre éclatant de l'univers:
Cris impuissants! Fureur bizarre!
Tandis que ces monstres barbares,
Poussaient d'insolentes clameurs,
Le dieu poursuivant sa carrière
Versait des torrents de lumière
Sur ses obscurs blasphémateurs."

Je n'ai que faire de vous rappeler le nom de l'auteur de ces magnifiques vers; les voix du passé vous le redisent assez.

Homère, Milton,Ossian, ces illustres aveugles mendiaient la gloire, une lyre au bras, dans les villes de l'Ionie, d'Albion--sur les sommets de Morven. Sachons gré à Apollon d'avoir souvent comblé de ses faveurs les plus signalées, ceux que le monde poursuivait de ses dédains et de ses injustes colères. La destinée de bien des poêtes, nous arrache à regret un pénible aveu: l'homme a souvent par ses injustices, causé le retour de ces émanations divines,—hâté leur rentrée dans leur céleste patrie, comme si leur séjour ici bas était une censure vivante, intolérable de ses injustices. Répétons ensemble pour la millième fois, les paroles suprêmes d'un jeune barde moissonné au prin-

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temps de la vie et dont le trépas sera un stigmate ineffacable au front du siècle qui le méconnût:—

Au banquet de la vie, infortuné convive
J'apparus un jour et je meurs.
Je meurs, et sur ma tombe où lentement j'arrive,
Nul ne viendra verser des pleurs.
Salut, champs que j'aimais et vous douce verdure
Et vous riant exil des bois!
Ciel, pavillon de l'homme, admirable nature,
Salut pour la dernière fois!
Oh! puisse voir longtemps votre beauté sacrée,
Tant d'amis sourds à mes adieux
Qu'ils meurent pleins de jours! que leur mort soit pleurée
Qu'un ami leur ferme les yeux!

J'ai dit que les lettres servaient d'ornements, devenaient jouissance dans la prospérité: voyez-les patronées par Auguste, Charlemagne, Alfred le Grand, Louis XIV, Jacques I., le grand Frédéric, de Prusse.

En vain un homme à brillants paradoxes a-t-il prétendu que le culte des lettres et des arts n'était propre qu'à amollir, à corrompre l'esprit humain; la gloire même de Rousseau a démenti ses théories. On sait de plus que ses convictions intimes sur ce point étaient en désaccord avec ses écrits.

Jean-Jacques allant un jour de Paris à Génève, jeta par hasard les yeux sur un papier-nouvelles qui se trouvait dans la diligence et y lut un paragraphe annonçant que l'académie mettait au concours la thèse suivante: *"Les lettres ont-elles contribué à exalter ou à corrompre les peuples?"* Rousseau exprima de suite le désir de concourir: un savant qui se trouvait à ses côtés, lui demanda s'il se prononcerait en faveur des lettres? Mais sans doute, lui dit Rousseau.—"Vous auriez tort, jeune homme, répliqua le gros bonnet. Si vous voulez vous distinguer, prenez l'autre côté de la question; car à coup sûr, personne n'osera nier que la culture des lettrers ne soit favorable à la gloire des nations ".—Rousseau adopta l'avis, ce qui nous a valu le trop fameux discours sur les lettres que vous connaissez tous. Ce fait nous est garanti par Bernardin de Saint-Pierre. Le culte rendu aux beaux arts, et le

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degré de splendeur de la littérature, a de tout temps servi à déterminer le point de civilisation et la puissance des divers peuples: "La littérature est l'expression de la société." On peut donc affirmer que la gloire des nations et le culte des muses sont sœurs. Les siècles héroïques ont fait naître leur Homère, leur Pindar, comme si la crainte de descendre tout entiers dans la tombe, les engageaient à laisser un barde pour répéter l'écho de leurs hauts faits aux générations futures.

Heureux les poëtes qui avaient pour s'inspirer les exploits d'un Achille, la colère d'un Ajax, la beauté d'une Hélène, et espérons qu'il en reste encore des copies—mais mille fois plus fortunées les nations qui avaient à leur solde ces fils du génie, dont la parole ailée devait planer pardessus tous les âges. Aucun pays ne rendit un culte plus solennel aux belles-lettres que la Grèce; on y créa les jeux Olympiques; on y décernait publiquement des récompenses aux vainqueurs. Ce n'étaient pas les couronnes les moins brillantes que celles réservées aux poëtes et aux orateurs. Le burin de l'histoire et les cothurnes de la tragédie, étaient non moins en honneur que le ceste d'Entelle ou la massue d'Hercule. Plus tard, Rome qui avait remporté la palme dans tous les genres de gloire, se passionna bientôt pour les lettres; l'Ionie lui avait soufflé sur l'haleine de ses zéphirs des velléités de gloire littéraire. L'art d'écrire, d'abord inculte, se perfectionna rapidement; Ovide, Horace, Tibule, Virgile, Lucain, encouragés par la considération et les récompenses qui couronnaient le mérite littéraire, tracèrent à leurs contemporains étonnés des tableaux enchanteurs des grandeurs de Rome et divinisèrent pour ainsi dire, dans leurs chants harmonieux, jusqu'aux crimes qui avaient signalé la fondation du berceau de Romulus.

C'était à qui célébrerait le plus dignement le peuple-roi. Le maître de Rome offrait au prince de ses poëtes une pièce d'or pour chaque vers de l'éloge de Marcellus. Si la poésie était digne de Virgile, le présent était digne d'Auguste. Rappellerai-je les pages éloquentes que la postérité doit à Tite-Live, Cicéron, Tacite, Sénèque, ces écrivains qui sont comme les génies-mère où la pensée humai-

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ne, selon l'expression de Sainte Beuve "se ravitaille, s'allaite depuis plusieurs siècles" Quelles esquises de mœurs dans Tite-Live! Tacite à qui les muses semblent avoir confié les rayons de l'histoire, tout en peignant les froides cruautés des maitres du monde romain, n'a-t-il pas donné aux tyrans des leçons qui les feront trembler éternellement? A ce propos un moderne disait que nul oppresseur du genre humain ne devait voir les œuvres de Tacite dans sa bibliothèque sans frémir de terreur. Comment mieux peindre l'aigle du Forum romain que de le présenter à vos regards le jour de la découverte de la conjuration de Catilina. Que l'on se figure siégeant dans un vaste temple l'assemblée des chevaliers et des sénateurs romains, dans toute la splendeur patricienne, vêtus de leurs majestueuses toges, et assis dans leurs chaises currules, discutant le sort du monde, leur tributaire, leur conquête. Ici vous reconnaissez à sa pourpre resplendissante,un proconsul accouru du fond de la Numidie; là, c'est le commandant des Gaules. Voyez à côté de cet illustre vétéran qui a blanchi à la tête des légions romaines, voyez le censeur de son siècle, Caton, appuyé sur le piédestal de la statue de Jupiter: plus loin, vous distinguez le petit fils de Scipion, dont le front rayonne de gloire et d'espérance, — il a déjà été trois fois consul. Un hérault vient annoncer la nouvelle d'une victoire: un autre, la défection d'une province. Tout est grave, tout est majestueux dans cet aréopage; on sent que ce sont les maitres du monde qui règlent la destinée des peuples. Bientôt les figures s'assombrissent; on se parle à voix basse, comme si quelqu'incident inattendu fixait l'attention générale: Catilina en effet venait de prendre son siège au milieu des félicitations de Céthegus, Lentulus, Pison.

Tout à coup du sein d'un groupe de personnages consulaires s'élance aux rostres, le premier magistrat de Rome. Son front large se comprime sous l'effort de la colère ou du dédain: enfin, rompant le silence, le salut de la patrie lui arrache ces mâles accents: sa voix tonne, et les coupables, où sont-ils?

"Jusques à quand abuseras-tu de notre patience, Catilina! Combien de temps encore serons-nous le jouet de

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ta fureur? jusqu'où s'emportera ton audace effrénée? Quoi! ni la garde qui veille la nuit sur le Mont Palatin, ni les forces répandues dans toute la ville, ni la consternation du peuple, ni le concours de tous les bons citoyens, ni le lieu fortifié choisi pour cette assemblée, ni les regards indignés de tous les sénateurs: rien n'a pu t'ébranler. Tu ne vois pas que tes projets sont découverts? que ta conjuration est ici environnée de témoins , enchainée de toutes parts? Penses-tu qu'aucun de nous ignore ce que tu a fait la nuit dernière et celle qui l'a précédée? dans quelle maison tu t'es rendu, quels complices tu as réunis; quelles résolutions tu as prises? O temps! O moeurs! tous ces complots, le sénat les connait, le consul les voit et Catilina vit encore! Il vit: que dis-je? Il vient au sénat; il est admis aux conseils de la république: il choisit parmi nous et marque de l'oeil ceux qu'il veut immoler. Et nous, hommes pleins de courage, nous croyons faire assez pour la patrie, si nous évitons sa fureur et ses poignards."

Concevez la terreur de ces forcenés confrontés face à face avec leur accusateur et leur juge. Catilina, nous dit l'histoire, malgré toute son audace et sa férocité, quitta le sénat les traits altérés et murmurant contre la république et le consul les menaces les plus sinistres. L'art de la parole employé pour sauvegarder ses concitoyens du pillage et du meurtre, quel plus noble triomphe! Les annales des lettres fourmillent de traits semblables. Le temps ne permet pas de vous entretenir bien au long des écrivains de Rome: il faut avoir vécu en intime avec les classiques latins pour se faire une idée de tout ce qu'il y a de suave et d'attrayant dans les poesies de Catulle,* de Ti-

*Je vois dans mon auditoire un de nos poëtes les plus connus; me permettra-il, à propos de Catulle de lui demander de rendre en français la gracieuse invocation d'Adrien à son âme avant de mourir?

Animula! vagula, blandula,
Hospes, comesque corporis,
Quæ nune abibis in loca.
Pallidula, rigida, nudula,
Nec, ut soles, dobis jocos?

[*Le poëte interpellé y a répondu et quinze autres aussi. Voir l'Appendice.*]

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bule, d'Ovide et dans les pastorales de Virgile: les images en sont fraiches comme la rosée de l'aurore. Catulle, le poëte des amoureux: Ovide, ce mélancolique rêveur: Tibule qui soupirait des chants d'une incomparable harmonie: Virgile également heureux soit qu'il retrace les mœurs pastorales,, qu'il peint les fureurs sécrètes de l'amour non assouvi, tel que la Reine de Carthage ou qu'il embouche la trompette épique pour célébrer les fastes des Romains. Quelle mosaïque littéraire que ce groupe d'esprits choisis!

En quittant ces aigles de l'horizon romain, le tableau s'assombrit avec la décadence de sa gloire. Le génie et la gloire marchent de pair: pour les peuples, Pallas et Minerve sont la même divinité sous des noms différents. Suivez les siècles et vous apercevrez les sciences délaissées, se refugiant sous la mitre d'un évêque ou se nourrissant de la sève du christianisme naissant. Les diverses églises de Rome, d'Antioche, d'Alexandrie, fournirent bientôt au monde des écrivains, des orateurs, des philosophes dont les écrits le disputaient à ce que la Grèce et l'Italie antiques avaient de plus parfait.

Ce n'était pas à tort que St. Jean Chrysostôme était surnommé "Bouche d'or." Ses discours, ses homélies, étincellent de beautés d'un ordre supérieur. Et qui mieux que l'évêque d'Hippone sut l'art d'émouvoir l'homme en lui dévoilant le secret de son être, lui au printemps de la vie, jeune seigneur Grec, qui après avoir épuisé avec les *roués* d'Athènes, la coupe des plaisirs à la mode, se désillusionna tout-à-coup et étonna ses anciens amis par la pureté de ses mœurs et par son éloquence de feu, autant qu'il les avait scandalisés par les désordres de ses premières années. C'est lui-même qui nous l'apprend dans ses Confessions.

Que dire d'un Origène, d'un Tertullien, ces puissants génies dont l'éclat à travers quinze siècles nous frappe comme les phares de la primitive église. On ne saurait nier que les œuvres des pères de l'église du troisième et du quatrième siècles ne soient des monuments d'érudition loin de mériter de la part des gens du monde l'oubli où la

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frivolité du jour voudrait les reléguer. Ce sont, au dire de Sainte-Beuve, "de vieux chênes dont les troncs contiennent des trésors de miel." Ceux qui désirent approfon dir cette branche de l'histoire des lettres trouveront dans le grand ouvrage de M. Ampére d'amples détails. On sait que ce savant académicien visitait naguère nos bords.

Chassée peu à peu par les barbares de l'asile que la religion chrétienne lui avait donné, la littérature erra proscrite par le monde. Pauvre exilée que la guerre éloignait de ses foyers, Minerve, un voile funèbre sur le front, quittait les rives classiques de l'Italie pour remonter à sa céleste patrie, attendant des jours plus prospères pour laisser jaillir sur la pauvre humanité quelques rares rayons.

Pendant le silence des nuits, on a pu entendre de temps à autre un faible écho de la Déité. Tantôt du sein d'un cloitre, mêlées aux ardeurs célestes, s'exhalaient des étincelles d'une passion mal étreinte, c'était Héloise pleurant Abélard. . Tantôt une plainte mélodieuse se répétait sur les rivages de l'Ausonie: c'était Pétrarque, s'efforçant de toucher le cœur de Laure plus dure que les rochers de la Thrace. Heureuse insensibilité qui nous a valu de semblables trésors littéraires!

Entassés tout poudreux dans la niche d'un monastère gothique, Homère, Virgile, Horace, attendaient en silence que Guttemburg sonnât le *rappel;* annonçat le trépas de l'ignorance, la chûte des ténèbres: alors devaient-ils, nouveaux Phœnix, renaitre de leur cendres . Horace, n'avait pas eu tort de formuler son fameux prôtêt *Non omnis moriar:* non il devait survivre et la meilleure partie de lui-même a survécu:

> "*Non omnis moriar, multaque pars mei*
> *Vitabit Libitinam,* . . . . . ."

On l'a dit: "La gloire, c'est la dette de l'humanité envers le génie."

Pendant toute cette époque voisine de la conquête des Normands, la littérature était entre les mains des trouvères, des troubadours, des menestrels et se composait de lais, de ballades, de contes, de chansons, de fabliaux plus ou moins grossiers; les princes mêmes se faisaient un mé-

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rite de griffonner en mauvais saxon ou en Normand baroque leurs exploits ou leurs amours. Robert Courte-Heuse, duc de Normandie, enfermé dans le Château de Cardif, adressait aux vagues qui battaient le pied de sa prison, ses plaintes en vers gallois. "Richard Cœur de Lion, fut couronné comme troubadour; il avait composé en langue romane un sirvente sur sa captivité à Worms. Il y célébrait sa naissance et se prétendait fils, non d'Eléonore de Guienne, mais de la Princesse d'Antioche, trouvée en pleine mer, sur un vaisseau tout d'or, dont les cordages étaient de soie blanche."

La littérature de ces temps reculés n'était qu'un tissu de fables plus ou moins ridicules où l'invraisemblable le disputait au merveilleux; une pature littéraire dont la chevalerie, la galanterie et la religion servaient de potage, d'entremets et de pièce de résistance.

Mais n'aurai-je pas un mot à dire en passant du moyen âge: de cette ère de chevalerie où le roi "S'honorait d'être gentilhomme avant de s'énorgueillir du titre de monarque."*

Qui en sera le type, le symbole? Sera-ce le jeune châtelain, avec l'or, le faucon et le cor de chasse, précédé de la harpe du troubadour et de la cithare du romancier,—et visitant les pays lointains et les cours étrangères pour se rendre chevalier parfait? Sera-ce le généreux paladin qui fuit son castel où il menait vie noble et joyeuse et où il a laissé sa femme et ses enfants à la garde de Dieu pour aller chevauchant en Palestine, où la mort l'attend, à la tête de ses cohortes qu'il va lancer au cri de guerre "*Dieu le vent!*" et "*Montjoie St.-Denis!*" Sera-ce cette noblesse féodale qui après avoir "édifié les églises, doté les abbayes, concédé aux serfs de ses domaines des actes d'affranchissement et aux bourgs des chartes de communauté et par là enfante, le peuple qui un jour dévorera sa mère:"† cette noblesse dis-je, que l'on retrouve partout où la patrie est en danger, à Bouvines, à Crecy, à Poitiers, à Azincourt, au premier rang, où la mort, comme le moissonneur qui

* Châteaubriand.

† Eysenbach.

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abat sa récolte, fauche sans se lasser jamais: cette noblesse qui arrose le sol du sang le plus généreux de la France? ou bien assombrissant les couleurs, vous montrerai-je comme types de la féodalité ces fiers et luxurieux barons, vampires du peuple, écrasant de leur talon de fer leur vassaux, qu'ils traitent comme une vile tourbe taillable, corvéable à merci et sans merci, ce même peuple qu'un conquérant fameux, l'élu des masses appelait "de la chair à canons," ce peuple enfin qui devait se lever dans sa force et faire main-base sur les dix huit siècles d'oppression qui pesaient sur lui. Mais, M. le président, cette digression me mène trop loin, et quelque soit le portrait que vous désiriez avoir de la féodalité, je vous assure qu'avant de condamner cette noblesse française à laquelle le Canada, notre patrie, doit tant, j'opinerai de grand cœur pour "un plus ample informé." Revenons à cette burlesque littérature du moyen âge:

"Les *miracles* et les *mystères*, remarque un écrivain célèbre, furent une partie essentielle de la littérature de tous les pays chrétiens depuis le dixième jusqu'au quatorzième siècle. Geoffroi, abbé de Saint-Alban, composa le miracle de *Sainte-Catherine* c'est le premier drame écrit en français dont jusqu'ici on ait connaissance. L'auteur le fit jouer dans une église en 1110 et emprunta pour revêtir les acteurs, les chapes de l'abbaye de Saint-Alban. Le clergé encourageait ces spectacles comme un enseignement public de l'histoire du christianisme: le théâtre grec eut la même origine religieuse. Les *miracles et les mystères* se donnaient en plein jour, dans les églises, dans les cours des palais de justice, aux carrefours des villes, dans les cimetières: ils étaient annoncés en chaire par le prédicateur; souvent un abbé ou un évêque y présidait la crosse à la main. Le tout finissait quelque fois par des combats d'animaux, des joûtes, des luttes, des dances et des courses. Clément VI accorda mille ans d'indulgence aux personnes pieuses qui suivraient le cours des Pièces Saintes à Chester." Ces spectacles étaient représentés pendant le carême: ils commençaient par la création et finissaient par le jugement dernier.

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L'auteur du *Génie du Christianisme* dont ces détails sont empruntés les relate sur l'autorité de Warton, l'historien. Ces mœurs vous semblent étranges; sans doute aussi rédicules que nos us et coutumes d'aujourd'hui l'eussent semblé aux hommes du bon *vieux temps.* L'abbé de la Rue remarque que dans ces temps-là les dames n'étaient pas suffisamment respectées et cite une satyre faite par un abbé intitulée *"Les Noces des Filles du Diable,"* où le beau sexe n'était pas ménagé. Les médecins, les riches, les chanoines avaient aussi leur lot dans les *Litanies des Vilains,* le *Credo* du *Juif,* le *Pater Noster* des *Gourmands.* Comme vous voyez, le mélange et du sacré et du profane est peu propre à vous inspirer du respect pour le *bon vieux temps.*

Permettez que je vous cite une des moralités (c'est le nom que portaient ces drames) des plus en renom à cette époque. Elle porte pour titre: *"Condamnation du festin, à la louange de la diète et de la sobriété, pour l'avantage du corps humain,"* vers la fin on fait le procès aux sieurs Festin et Souper devant le Juge en chef *Expérience.* Voici le délit: Festin et Souper sont accusés d'avoir causé la mort à plusieurs personnes. Le juge *Expérience,* après avoir entendu les parties par leurs avocats sans doute, (car que deviendrait le monde sans avocats,) condamna Festin à la potence: le bourreau, c'est la Diète. Festin ayant à son côté son confesseur, commence publiquement une confession générale de toutes les énormités, de toutes les indigestions, de toutes les apoplexies, et de toutes les migraines qu'il a causées: le récit en est si affreux que le bourreau scandalisé lui met la corde au col et le pend bel et bien. Dans ces temps-là, voyez-vous, Beccaria n'avait pas encore écrit sur l'abolition de la peine de mort. Voilà pour Festin. Quant à Souper, la Cour le condamne, vû la nature de l'offense à porter du plomb dans une main pour l'empêcher de mettre trop de plats sur la table à la fois et le force à donner caution de ne jamais se trouver sur le passage du Diner: de plus, à ne se mettre en route que six heures après lui.

On trouve, comme vous voyez, un certain sel répandu

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dans ces pièces malgré leur incohérence; nos ancêtres étaient donc plus spirituels que leurs détracteurs ne le prétendent: mais paix à leurs cendres: point de médisance des absents.

Je vous ferai grâce de la troupe d'écrivailleurs de cette époque. Quelques esprits supérieurs ont néanmoins laissé des traces durables de leur passage. En Angleterre, Chaucer, Froissart, Bower: en Italie, Bocace, le Dante, Petrarque, plus tard le Tasse: en France, Ronsard, le jovial Curé de Meudon, Montaigne, Voiture présidaient à la renaissance des lettres. Leurs essais se ressentent généralement de l'enfance de l'art: la pensée humaine était encore au maillot. Il fallait les puissants génies du siècle de Louis le Grand pour déblayer les ruines du passé, et pour émanciper l'intelligence des peuples. M. le Président, je m'aperçois que j'ai déjà outrepassé les bornes que je m'étais prescrites. A une autre soirée, de vous entretenir des écrivains du grand siècle.

APPENDICE.

L'appel de M. LeMoine donna lieu à un petit tournoi littéraire où quinze jouteurs prirent part. M. P. Lemay, en tête:—

"Animula! vagula, blandula,
Hospes, comesque corporis,
Quæ nunc abibis in loca.
Pallidula, rigida, nudula,
Nec, ut soles, dabis jocos?"

"Noble compagne de mon corps,
Ame douce et mystérieuse,
Qui t'enfuis au séjour des morts,
Comme ici seras-tu joyeuse,
Ou seule avec de vains remords."

"P. LEMAY."

Un Anglais du Haut Canada:

"Douce compagne, hôtesse de mon corps,
Mon âme! délaissée et pâle et nue,
Ou vas-tu errante à perte de vue?
Dans quels séjours de tristesse et de mort?
Ton rire accoutumé, tes traits d'esprit;
Cesseront-ils, quand tu n'es plus ici?"

"W. KIRBY."

"Niagara, Haut Canada, 26 Dec., 1865."

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"Ma petite âme vagabonde,
Hôte et compagne de mon corps,
Qui va partir pour l'autre monde,
Comment seras-tu chez les morts?
Avec ta gaité si constante?
Ou pâle et nue, et grelottante?"

"C. D."

"Kamouraska, Janvier, 1866."

"Toi, de mon pauvre corps hôtesse vagabonde,
Toi, sa douce compagne, aux bons, aux mauvais jours?
Mon âme, tu t'envoles vers un autre monde!
Que vas-tu devenir, en ces lointains séjours?
Seras-tu—pâle, délaissée,
Sans espoir et sans avenir,
Captive, pour toujours, d'une sombre pensée?
Ou de notre bon temps auras-tu souvenir?"

"EMANUEL BLAIN DE ST. AUBIN."

"Petite âme! compagne errante,
Aimable hôtesse de mon corps,
Ah! que deviendras-tu, toi, toujours si riante,
Dans ces lieux ténébreux, nus et glacés des morts?"

"F. G. JUNEAU."

"Ma petite âme vagabonde,
Riante, hôtesse et compagne du corps,
Qui t'en vas en l'autre monde,
Pâle ,glacée et sans decors,
Tu ne lanceras pas comme c'est ton usage,
Tes traits de piquant badinage?"

"EPHREM TURCOT."

"St. Henri, 24 Janvier, 1866."

"Petite âme rêveuse, autrefois ravissante,
Hôte si bien traité, compagne de mon corps,
Iras-tu désormais dans le séjour des morts,
Pâle, rigide et nue, et froide et languissante,
De tes chants si joyeux oublier les accords?"

"* * *"

"Ottawa, Janvier, 1866."

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"Petite âme! hôtesse inconstante!
Douce compagne de mon corps,
Ah! toi qui maintenant t'envoles chez les morts,
Et pâle et nue et grelottante,
Auras-tu comme ici, cette gâité constante,
Tes traits d'esprit badin et ta verve piquante?"

"EMMA HUOT."

"Saint Roch, 1 Janvier, 1866."

"Ma petite âme! inconstante et rêveuse,
Hôte et compagne de mon corps,
Toi qui t'en vas sur d'autres bords,
Pâle, nue et toute frileuse,
Ne seras-tu donc plus joyeuse?"

"B. R."

"Hôtesse gracieuse et compagne inconnue,
De mon corps, qu'aujourd'hui tu quittes sans souci;
Dans les lieux où tu vas, pâle tremblante et nue,
Petite âme, dis moi, seras-tu comme ici?"

"Sorel."

"Petite âme inconstante,
Mais hôtesse charmante,
Irez-vous chez les morts
Compagne de mon corps,
Pâle, froide et chagrine
Sans faire la badine?"

Autre version:

"Petite âme chérie
Hôtesse réjouie,
Compagne de mon corps
Irez-vous chez les morts,
Et pâle et froide et nue
De vos plaisirs déchue?"

"UN SEXAGENAIRE."

"Trois-Rivières."

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"*Au Rédacteur du Journal de Québec*:

"Trois-Rivières, 16 Janvier, 1866.

"M. le rédacteur,

"Je trouve sur votre numero du 13 courant, les deux essais que je vous avais transmis concernant la traduction *d'animula*, etc., etc. Il n'est certainement pas aisé de saisir le véritable sens de ces cinq petits vers ni de le rendre en français d'une manière satisfaisante: Ca donc dû être pour moi, surtout à mon âge, une témérité de me mettre en lice et d'entreprendre cette traduction. On fait des folies à tout âge et vous entendez bien qu'à 69 ans, on en fait davantage. Mon âge doit donc me servir d'excuse, mais enfin, puisque j'ai commencé ce travail, j'ai cru devoir le continuer, sans pourtant faire de grand progrès. Cependant, en réfléchissant, j'ai cru devoir me reprendre, et comme vous devez le penser, où j'en suis, ce n'est pas la première fois que je me suis repris, ni que je l'ai été, et au risque de l'être encore, je vous transmets une traduction nouvelle que voici, et c'est le *nec plus ultra* de mes forces qui, comme vous allez le voir, ne sont pas de nature à faire peur à personne:—

" Petite âme coquine,
Hôtesse douce et fine
Compagne de mon corps,
Iras-tu chez les morts
Pâle, froide et gredine
Y faire la badine?"

"Eh bien, monsieur, c'est une fatalité! en achevant d'écrire ces derniers vers, voici qu'un autre sens se présente, et je crois devoir le saisir au passage. Pour le coup, ne me jugez pas trop sévèrement, quoique vous pourriez bien le faire sans indiscrétion, et je sens que je n'aurais nul droit de m'en plaindre.

" Petite âme coquine,
Hôtesse douce et fine,
Compagne de mon corps,
Allant chez d'autres bords,
Pâle, froide et gredine,
Y seras-tu badine?"

"Comme vous pouvez le voir, la différence n'est que dans le sens du dernier vers et peut avoir sa raison d'être. Au reste, il faut l'avouer, le sens de cet énigme est aussi fugitif que l'âme dont elle est l'objet; car plus on le médite, (car je crois que c'est pour nous une énigme, si toutefois elle ne l'était pas lors de sa composition,) moins on est certain d'en saisir le véritable esprit.

"Dans tous les cas, monsieur, que ma traduction soit bonne ou mauvaise, je n'entends pas d'y revenir, je n'ai donc qu'à vous remercier de votre indulgence et à demander pardon de ma témérité.

Votre etc., "UN SEXAGENAIRE."

"Trois-Rivières."

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"Ame subtile et vaporeuse
Dont le flambeau guide mes pas
Loin de ta demeure argileuse,
Ou vivras-tu comme ici-bas?"

Seconde version:

"Ame céleste et vaporeuse
Douce compagne d'ici-bas
Loin de ta demeure argiteuse,
Souffriras-tu, dis, ne riras-tu pas?"

"L. H. F."

"Pointe Levis."

Ecoutons, Byron:

"Oh! gentle, fleeting, waiv'ring sprite,
Friend and associate of this clay!
To what unknown region borne
Wilt thou now wing this distant flight,
No more with wonted humour gay,
But pallid, cheerless, and forlorn."

Le *Journal de l'Instruction Publique* s'exprime comme suit:—

"Le petit tournoi littéraire provoqué par M. LeMoine, au sujet d'une épigramme de Catulle, dont nous avons parlé dans notre dernière livraison, se continue, et parmi les nombreuses tentatives qu'ont enregistrées les journaux, nous remarquons celle d'un *Sexagénaire*, qui a donné une tournure plus vive et plus narquoise à ses vers que tous les autres concurrents. Il n'a point fait moins de trois traductions différentes: voici la meilleure à notre avis:—

"Petite âme coquine,
Hôtesse douce et fine
Compagne de mon corps,
Iras-tu chez les morts
Pâle, froide et gredine,
Y faire la badine?"

"On nous écrit sur le même sujet ce qui suit. Notre correspondant est un Anglais qui est en état d'apprécier la litérature française, comme on peut le voir à la manière dont il écrit notre langue:—

"Avez-vous remarqué ce que l'on perd en traduisant le latin; ce

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que l'on fait des cinq vers qu'Adrien adresse à son âme? Il est vrai que Lord Byron était bien jeune à l'époque de sa traduction; mais voyez que de fautes! Il y introduit de nouvelles idées. Où trouve-t-on dans l'original ce 'gentle wav'ring fleeting' du premier vers? Il aurait pu voir que 'hospes' n'est pas la même chose que 'friend.' Il ajoute 'unknown,' et traduit 'rigida' par 'cheerless,' 'nudula' par 'forlorn,' et perd complétement l'exquise concision et l'élégance du latin, qu'on a bien mieux conservée, dans la seconde traduction française que vous avez publiée. Seulement il me semble qu'on a eu tort d'y mettre 'chez les morts,' et d'oublier ce joli mot 'blandula.' Ne pensez-vous pas comme Horace:—

"* * * *Mediocribus esse poetis,
Non dî non homines, non conssere columnæ?"

Voici une autre traduction anglaise. Elle est de Merivale, je crois. Ne la trouvez-vous point bien supérieure?

" Soul of mine, pretty one, fleeting one,
Guest and partner of my clay,
Whither wilt thou hie away,
Palid one, rigid one, naked one,
Never to play again, never to play?"

Mais enfin, si on voulait citer quelque chose de vraiment admirable, ce serait l'ode de Pope: "The dying Christian to his soul." Vous la connaissez sans doute, car ce sont les vers les plus élevés de notre langue.

THE DYING CHRISTIAN TO HIS SOUL.

ODE.

I

Vital spark of heavenly flame!
Quit, ah quit this mortal frame!
Trembling, hoping, lingering, flying,
Oh the pain, the bliss of dying!
Cease, fond Nature, cease thy strife,
And let me languish into life!

II

Hark! they whisper; angels say,
"Sister Spirit, come away!"
What is this absorbs me quite?
Steals my senses, shuts my sight,
Drowns my spirits, draws my breath?
Tell me, my Soul, can this be death?

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III

The world recedes; it disappears!
Heaven opens on my eyes! my ears
With sounds seraphic ring:
Lend, lend your wings! I mount! I fly!
O Grave! where is thy victory?
O Death! where is thy sting?

[Note—Steele, in a letter to Pope, December 4, 1712, requested the poet to "make an Ode as of a cheerful dying spirit, that is to say, the Emperor Adrian's *Animula vagula*, put into two or three stanzas for music." Pope sent the above: "You have it (as Cowley calls it) just warm from the brain. It came to me the first moment I waked this morning; yet, you will see it was not so absolutely inspiration, but that I had in my head not only the verses of Adrian, but the fine fragment of Sappho." He must also have recollected a piece by Flatman (a poet then so obscure as to be unknown to Pope), which contains these lines:—

"When on my sick bed I languish,
Full of sorrow, full of anguish,
Painting, groaning, speechless, dying;
Fainting, gasping, trembling, crying,
Methinks I hear some gentle spirit say,
'Be not fearful; come away!'"

Flatman had probably drawn from the same fountain, the Ode of Adrian:

"Animula vagula, blandula,
Hospes, comesque corporis,
Quæ nunc abibis in loca?
Pallidula, rigida, nudula,
Nec, ut soles, dabis joca."

Thus imitated by Prior:—

"Poor little pretty, fluttering thing,
Must we no longer live together?
And dost thou prune thy trembling wing
To take thy flight thou know'st not whither?
Thy humorous vein, thy pleasing folly,
Lies all neglected, all forgot;
And, pensive, wavering, melancholy,
Thou dread'st and hop'st thou know'st not what."

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PAPER IV.—ON THE HISTORY OF CANADA.

BY JOHN WILSON COOK, ESQ., ADVOCATE.

(Read before the Society, Feb. 21st, 1866.)

The history of Canada cannot yet be fully written. Although much progress has been made, the country is still in its infancy; although there have been fierce political disputes, the results of them have as yet been but imperfectly realized. Still, in looking forward to the future of Canada, it is interesting to revert to the past history of the country—a history which tells of the strife and jealousy of races—of the reign of oligarchies—of a struggle for parliamentary supremacy, and of the final attainment of it.

When the army of Wolfe ascended the St. Lawrence, the small colony living on its banks scarce numbered fifty thousand souls; the cultivated lands of the Province were portioned into seigniories, and were the property of the seigniors—descendants, for the most part, of noble families of France. The accounts of travellers, particularly the work of a Swedish baron, who published a volume of travels in Canada some ten years before the conquest, give valuable as well as amusing accounts of Canadian life at that time. The *habitant* he declared to be an unchanged Norman peasant, rejoicing in every peculiarity, virtue, and prejudice of the orignal *bonnet rouge* of Normandy. And the government was as antique as the people. In these days of parliaments, elections, and popular sovereignty, it is curious to think that a feudal government once bore sway in Canada. But, with scarce a murmur, the inhabitants submitted to the exactions of Governors and Intendants. They looked on government as paternal; and the commands of the King's servants, arbitrary

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though they might be, were submitted to with filial obedience.

But we would judge very unwisely of Canadian society before the conquest, if we merely considered the primitive simplicity of the country *censitaires*. The Swedish nobleman, from whom we have before quoted, speaks with enthusiasm of the society of Quebec. Dining at the Governor's chateau with the Intendant, the Bishop, the Chief Judge, and a number of Seigniors, he seems almost to have thought himself at Paris. French wit and French wine conspired to make him think that he was once more in Europe. He maintains strongly that the society of Quebec is the best society in America, and expresses his astonishment at meeting so much cultivation in such a country. The then rulers of Canada, although their government was very arbitrary, were educated, courteous, and well-bred gentlemen; and, although we live in times of more general enlightenment, it would, perhaps, be well if some of their qualities were even now more general among our ministers and members of parliament.

The object and intent of French policy in Canada may be said to have been the establishment of a new France, in all respect a counterpart of the old. The only apology for popular privileges was the existence of a Superior Council, composed of the civil, military, and ecclesiastical dignitaries of the Province, by which the *arrêts* of the King for the government of his Canadian subjects were enregistered before they became law; and in this respect, as in some others, the Superior Council performed duties analogous to those of the *Parlements* of France. Of liberty, in our full British sense of the word, there was none. The *censitaires* were subject both to the seigniors and to the government; the seigniors, on their part, were at the mercy of the executive officers. There was, however, much to be admired in French rule in Canada. While the brave Norman settlers had to battle for life against powerful tribes of natives, pious missionaries were sent, under the protection of the government, to convert the Indians to the Christian faith; and although the record of their

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labours is a record of Christian heroism, this is not all for which we have to praise them, and the government for which they acted. The most extensive building which the Lower Province can yet boast, the building at Quebec now known as the Jesuit Barracks, originally intended for a University, is a noble monument of their zeal; and they will ever be held in honour for making a provision for the higher education of the people, unsurpassed in comparative munificence in any country.

It is unnecessary to dwell on the circumstances attending the battle of Quebec—the first step to the final conquest of Canada by Great Britain. The British army had been many weeks encamped in the vicinity of the city; and it is not long since old people were to be found, born in the neigbouring villages, and connecting their age with one which had passed away, who remembered, in their early childhood, following George the Second's troops into the conquered city. Wolfe's famous declaration, that he died happy, is known to every one. The Marquis de Montcalm, though defeated, died also like a hero. After the battle had been lost irretrievably, he retired wounded to the town. We read that, as he was entering by the St. Louis Gate, an old woman exclaimed, on seeing him feebly sitting on his horse, *"O mon Dieu! le général est blessé!"* and that, with true French gallantry, he stopped for a moment to beg her not to fear, for they had been conquered by a generous foe. In his last words, he expressed his joy that as he was destined to be defeated, it was also destined that he was to be defeated by such enemies. It was not very long before Montreal was also surrendered, and the whole Province ceded to Great Britain.

The history of early British rule is exceedingly interesting. Of course, for a lengthened period, military government alone prevailed. To trace the gradual introduction of civil administration, the admission of parliamentary government, and the final recognition of parlia-

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mentary supremacy, is a study which will not be neglected. As Canada becomes more and more of a nation,—as Canadians become more and more Canadian in their feeling, they will regard with increasing interest the various phases of the struggle which resulted in the final establishment of our present system of government. At the conquest, the new subjects were promised protection in all their civil and religious rights; and although the treaty between the King of France and the King of Great Britain distinctly restricts the stipulations of the British commanders, by the words "as far as the laws of Great Britain will permit," they were wisely, as well as generously, from the very first, accorded full protection in both. It would, indeed, have ill become a great nation to have refused such protection to colonists of another race, who had almost unexpectedly become part of the empire.

The colonists of French origin—the "new subjects," as they were called—did not object to the order of government which followed the conquest. Abitrary as that government might seem to Englishmen accustomed for ages to institutions more or less free, it was so in their eyes. Nor, indeed, could it seem to them as other than a milder form of the despotism under which they had before lived. *Lettres de cachet*, and monopolies of the grossest order—monopolies sometimes even extending to the necessaries of life—disappeared with the old regime. In the case of the common people, the mildness of English military government, as compared with the harshness of the French emissaries, did much to reconcile them to becoming the fellow-subjects of men of a different race, and a different religion. And it was not very long before the turn of events in France led the members of the Canadian noblesse, who remained in Canada after the conquest, to transfer to the crown of England much of that chivalrous loyalty which they had before borne to that of France. The writings of the French philosophers were beginning to impart new ideas to the French people and to the world. The great Revolution was drawing near. The nobles of

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France began already to fear that a cruel retribution would follow the oppression of ages; and as the idea seized their Canadian kinsmen, they drew closer to their English fellow-subjects, and became more reconciled to English domination. It was not long after the conquest before the French Canadian gentry were attached, and even enthusiastic, subjects of Great Britain; and it was not alone in Canada that they proved this. Some of them took commissions in the British army, and fighting against the enemies of England,exhibited the courage of their fathers, who had so long strenuously resisted the encroachments of the English colonists of the now United States. The early British governors treated the seignorial families with the respect to which they were entitled—invited them to the chateau, which was then the vice-regal residence—conferred on their members offices of some dignity and little labour; and it only needed the Revolution of 1789 to alienate them as a class for ever from the land of their ancestors.

But British emigrants soon began to settle in the country. Very shortly after the conquest, there were to be found, both in Quebec and Montreal, Scotch and English merchants, many of whom realized fortunes in Canada. Their letters led others to come to the Province, and in fifteen years after the battle of Quebec, there were scattered through Lower Canada several thousands of British people, not connected with the army or the government. It is entertaining and instructive to note how promptly, and unitedly, they objected to military government. The British residents of Quebec took counsel with the British residents of Montreal. Almost unanimously they agreed that the state of things established at the conquest had lasted sufficiently long. Although they had changed the sky under which they lived, they had not, they said, left behind them the spirit of Britons. In England the members of the executive were responsible to parliament, should there not be a parliament in Canada, to which the advisers of the crown should at last explain and justify their acts? It was in 1774 that the first resolute attempt

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was made to carry out these views. In that year earnest petitions for a House of Assembly were sent to England—petitions which unquestionably expressed the wishes of the British residents. But many difficulties were in the way. Nothing could induce the new subjects to take part in the agitation for a parliament. The mass of the people were perfectly uninformed as to what a parliament meant; and the seigniors protested perfect faith in the officers and ministers of the King. And, in fact, the French Canadians were not wrong in refusing to pray for the establishment of a House of Assembly. They could hardly, indeed, have been expected to concur in the demands of their British fellow-citizens. The early British residents, although they fought manfully for political privileges for themselves, had but little idea of conferring them on others; for they asked, not for a general House of Assembly, but for a House of Assembly composed exclusively of Protestants. We should not, however, be too ready to condemn the intolerance of the first advocates of parliamentary government in Canada. It was only in 1829 that liberal views in this very matter triumphed in England; and there could be no reason to expect from a handful of traders, in Quebec and Montreal, opinions which did not gain the day in the mother country till more than fifty years after their agitation for a parliament.

The narrowness of the demands of the British residents conspired to delay the establishment of a House of Assembly on any footing, with the distrust of colonial legislatures in general which had been caused by events in the other American colonies; and, on the whole, it was better that the delay should have taken place. While Baron Maseres, once Attorney General of the Province, and a great friend of the colonists, advised them, in lengthened correspondence, not to press too strongly for a House of Assembly, lest in that body equal privileges should be accorded to Roman Catholics and Protestants, the leaders of the French Canadians informed themselves about parliamentary government. Every year brought new settlers to the country. The settlement of Upper Canada

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had begun. The British demands for a House of Assembly became more urgent and more liberal. The new subjects began gradually to accede to the views of the old; and at last, by the Quebec Act of 1792, the country was divided into Upper and Lower Canada, and a regular legislature established in each Province. This famous measure was introduced by Mr Pitt, and opposed on several grounds by Mr. Fox. Instead of being separated, the Upper Canadian British and Lower Canada French should, in the opinion of Mr. Fox, have been from the very first united closely together. He opposed also crown nomination to the Legislative Council, and maintained that that body should be elective, but chosen by persons of property from among persons of the highest property. The crown nomination system, which Mr. Fox opposed, has been done away with. That election to the Legislative Council should be confined to persons of the highest property is a principle which would never be agreed to. But if two houses of parliament are to be retained in Canada, one of which is to act as a conservative check on the other, it may certainly yet be found necessary to make the Legislative Council the choice, not of all the people, but of a higher class of electors than the House of Assembly. It is fortunate that the debates on the Canada Bill were amply reported, for they must ever be of importance to those engaged in the study of Canadian history.

The first Parliament of Lower Canada met at Quebec on the 17th of December, 1792. The vice-regal speech was, in the absence of the Earl of Dorchester, delivered by General Clarke. Chief-Justice Smith was appointed Speaker of the Legislative Council. Mr. Panet, an advocate of Quebec, of high standing, was elected first Speaker of the Legislative Assembly. The first Parliament of Upper Canada met at Niagara on the 15th of October of the same year, and was opened by the Lieutenant-Governor, General Simcoe.

In the Lower Canada House of Assembly, the French

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members were in a large majority. The Legislative Council, where the nomination was in the hands of the crown, consisted chiefly of office-holders—most of them of English origin, while some of the members were chosen from the old seigniorial families.

The first question which arose was as to what language the business of parliament should be conducted in. It was finally decided to make use of both languages, as is now done in the united parliament.

It was not long ere the great question was mooted which agitated Upper and Lower Canada during well-nigh all their existence as separate Provinces. It was soon found, both in Upper and Lower Canada, that, in the eyes of the Governors, the Legislative Council was of more consequence than the House of Assembly. Nor can any one deny that there was much ground for the preference. In the first Lower Canada parliaments there were members of the House of Assembly who were little, if at all, removed above the people who elected them. In the Legislative Council the case was very different. There were in it, from the first, men of information and talent, inclined to despise the representatives of the people, and who considered themselves entitled to full power; and it was some years before the House of Assembly was at all able to compete with the Council. But gradually the Assembly improved. Mr. Bedard was the first French Canadian leader who agitated systematically for the supremacy of the House of Assembly. Arrested, by order of Sir James Craig, for alleged seditious practices, a Committee of the Assembly was appointed to intercede for him, but feared to act, and the House released them from their commission. The seditious speeches imputed to Mr. Bedard were harmless in comparison with many things now spoken and written on the administration of affairs every day in Canada. A patriotic and able man, he aimed to promote the liberties of the people; and he was the teacher, as well as predecessor, of those who maintained his

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principles, and witnessed their triumph. Another sign of popular progress in Lower Canada was the publication of a newspaper in the French language. Two papers in the English language had been published previously—one, the *Gazette*, since 1764; the other, the *Mercury*, since 1805. The *Mercury* supported out and out the Legislative Council: the *Gazette*, edited by Mr. John Neilson—one of the most able and honorable of the men who have taken part in the political contentions of Canada—leaned, though with wisdom and moderation, to the popular side. But *Le Canadien*, the French newspaper, was needed to maintain the rights of the French population, and to instruct them in parliamentary warfare. The stand taken by Mr. Bedard and his friends was a perfectly logical one. When it was said to them, that the French Canadians were infinitely more free then than they had been under the government of France, they answered, that it was undeniably true; but that, having been made against their will British subjects, they had a right to the privileges of other British subjects. To comprehend rightly the whole importance of the stand taken by Mr. Bedard and his friends, it must be remembered that, as a general thing, they were not seconded by their fellow-citizens of British origin. The position of the latter was, indeed, different from that of the French Canadians. They belonged, at least, to the governing race. The leading members of the Legislative Council, well-nigh all the members of the Executive, the majority of the Judges, were English. They did not, then, sympathize with a House of Assembly composed, for the most part, of French Canadians, who, if they succeeded in their efforts, would divide power with Englishmen. It thus came about that, although the non-official British had clamoured lustily for a House of Assembly elected by the people, they for the most part, sided with the Legislative Council nominated by the crown. And, in fact, the history of Lower Canada presents the spectacle of Frenchmen contending stoutly for the predominance in the state of an institution formed in imitation

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of the great defence of British freedom; while Englishmen were, from circumstances, willing that the power of that body should be trodden under foot. The Governor and Council was the watchword of the majority of the English: the House of Assembly was the cry of the French. Mention has been made of *Le Canadien* newspaper, in which the views of the French Canadian liberals were first expressed. The state of public liberty during the government of Sir James Craig, which immediately preceded the American war, may be gathered from the fact of its suppression of this journal and the seizure of its press. An article in the paper having given offence to the Governor, he sent down a posse of soldiers, by whom everything belonging to the printing department, together with all letters and manuscripts found in the office, were conveyed to the court-house. Of course no Governor now would for a moment dream of such a proceeding; were he to resort to anything at all akin to it, all parties, would unite in condemning him. But the *Mercury* of the next day warmly applauded the despotic act of the gallant old officer, who, no doubt, thought perfectly honestly that British freedom of discussion was a good thing in Britain, but out of the question in Canada. The liberty of the press, now too often turned to license in Canada, was not won without a struggle.

In Upper Canada, the state of affairs was in many respects different from that in Lower Canada. There, there was but one race, for the great majority of the inhabitants were of British origin. As might be inferred, from the very race of the people, they quickly divided into parties. Conservatives and Radicals played, on the banks of Lake Ontario, the parts of Tories and of Whigs in England. The influence of the Governors of the Province was almost exclusively given to the Conservatives, and every Judge, every sheriff,every bailiff, and every custom-house officer, was an agent and a canvasser of the party. It had occured to a few families—descendants, for the most part, of persons who had espoused the anti-colonial side at the American Revolution, that they had a divine

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right to govern the country as they thought best. The executive and the bench were completely at their mercy. They considered themselves the rulers of the lands; and their unwarrantable assumption of superiority was as detestable as their selfish and monopolizing spirit. The domination of the Family Compact has passed away for ever. But the evil effects of the rule of their party long continued to be felt. Nor is it unfair to regard the Upper Canada Rebellion of 1837 as one of their achievements; for had the Upper Canadians not been goaded to rebellion, they never would have rebelled. The opposition which was offered to the Family Compact is one of the most honorable points of Canadian politics. The government of Lower Canada may be said to have been in the hands of a clique at Quebec, as that of Upper Canada was in the hands of a clique at Toronto. But there was a difference between the two. The governing party at Quebec was, in many respects, of a better stamp. The executive councillors of Lower Canada had, for the most part, the sense of honor which is characteristic of gentlemen. The executive councillors of Upper Canada were, with some honorable exceptions, grasping and unscrupulous. The fact that the Rebellion, which was in a great measure their work, hastened their overthrow, should, itself, make us regard the immediate authors of that event with something of consideration.

Rebellion was, indeed, an event which many anticipated long before it actually occured. Although the whole people, French and English, had both in Upper and in Lower Canada, courageously united in 1812 to repel American invasion, the persons sent to administer the government never regarded them with confidence. Both in Upper and in Lower Canada the feelings and wishes of the people were unnecessarily set at defiance. A conciliatory policy would have prevented the Rebellion, calmed the animosities of race, and commenced that process of consolidation and union which is now at length happily going on. But this was neglected. The disputes which led to the Rebellion led also to the alienation of French and English.

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When the Upper Canadian Reformers were protesting against the tyannical acts of the Family Compact, the British Lower Canadians were ready to defend acts in themselves little better, because they were perpetrated by officers of British against citizens of French origin.

When, in 1837, the Rebellion broke out, the unpopularity of the government was not greater than it had been for a long time previous. But the popular bodies of both sections had become much stronger, and the feeling of dissatisfaction had become more general. There were, both in Upper and Lower Canada, two divisions of the popular party. These were the supporters of peaceful agitation, and the advocates of physical force. Unfortunately the counsels of the latter led to an unnecessary, though not unprovoked, rebellion. Had there been no Rebellion in 1837, the Province would not have so soon gained Responsible Government. But the old Crown colony system could not have lasted much longer. What it was foolishly as well as wrongly attempted to win by force of arms, would have been at length gained by peaceful declarations of public opinion. But it must be admitted that the Rebellion hastened the triumph of parliamentary goverment. It called attention to the state of things in Canada; it pressed, as it were, for measures of reform; and when the Union of the Provinces, to which it contributed, was accomplished, it led to the tacit acknowledgment of Parliamentary supremacy.

The Union, which took place in 1841, was strongly objected to in both sections of the country. By many Upper Canadians it was said that it would destroy the character of Upper Canada as a British Province. In Lower Canada, on the other part, it was argued that the work of ages would be destroyed by Lord Sydenham; that French Canadian influence would be rooted out for ever; that even the stipulations and guarantees of the treaty would be violated. If the truth were told, Lord Sydenham carried, to a great extent by corruption, a Union which has been productive of much good to both the parties to it. In spite of

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all malcontents, the Provinces were in 1841 united. Every artifice has been resorted to, on both sides, that could tend to excite jealousy and antipathy between them. But these attempts have invariably recoiled on the heads of their authors. The mass of the people of both sections have not ceased to regard the Union as other than a necessity, of which no antipathies or jealousies would justify the abandonment.

It has been said that, by the Act of 1841, the doctrine of Parliamentary supremacy was tacitly recognized. But the old battle of the separate Provinces had to be fought again in the united parliament. The Conservative party, which he believed to be the only party truly loyal, met alone with the favor of Lord Metcalfe. The name of that excellent man should not be mentioned without respect. The great aim of his life—spent in the service of his country—was the performance, at any cost, of duty. But he hardly, perhaps, understood the position of affairs in Canada, and, from a mistaken sense of duty to his Sovereign, unduly depressed the Reform party of the Province. However this may be, his attempts to form a strong Conservative ministry entirely failed: the Reformers of both sections were determined that neither the eloquence of their leaders, nor the sympathies of the Governor General, should keep in power men who had been opposed to Responsible Government; and there occured disputes with the Governor not unworthy of the palmiest days of the Lower Canada parliament. The first administration which really possessed—after the Union—the confidence of the Governor General, and the confidence of the majority of the people, was that formed in 1848, by the late lamented Sir Louis Lafontaine, and Mr. Baldwin. The next cabinet was that of Mr. Hincks, now Governor of British Guiana. The Hincks ministry—celebrated for the great public works constructed under its auspices—was replaced by a coalition of Conservative and Reform politicians, which accomplished much to advance the interests of the country. The Seigniorial question, the settlement

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of which, in Old France, had been followed by bloodshed and massacres of hideous cruelty, was, in Lower Canada, disposed of by an Act of Parliament. The Clergy Reserves question, the final disposition of which the public peace imperatively required, was settled in accordance with the wishes of the majority, but with an honorable regard to the claims of incumbents. Whether the change in the constitution of the Legislative Council by which that body was rendered elective, was a wise one, is however, doubtful. Two Houses elected by the same people, and representing the same opinions, are very likely to be swayed by the same motives of expediency. And it must be remembered that the old Crown-nominated Legislative Council had ceased altogether to be either able or willing to thwart the nominees of the people. Not only had the expulsion of the judges done much to weaken the Council's power: it could be, and sometimes had been, swamped by ministers who had a majority in the House of Assembly. The rendering of the Legislative Council elective at all is an amusing instance of the infliction of punishment on a political body after it had ceased to be mischievous. Harmless though it had become, it still retained something of its old constitution; and the ultra-Liberals were resolved that all that it so retained should be done away with.

Responsible Government, in other words, Parliamentary Government in its integrity, has, since its establishment in Canada, been assailed from different points of view with equal bitterness. The ultra-Conservative has regretted the undue license which it seems to him to have induced; the ultra-Radical has regretted that under it, destined though he used to think it to be a panacea for all ills, his favourite hobbies have been very frequently rejected. It has been found, as it was certain that it would be found, to be an expensive system; and so many errors, or imaginary errors had been committed under it, that some have had serious misgivings as to the political future of the country.

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But there is little ground for such fears. The great national progress which Canada has achieved since the union of the two Provinces, has been accompanied by progress of a higher order. Schools, Colleges, and Universities have sprung into existence. As the education of the people advances, it will be easier to work well and wisely, a system of government which greatly depends for its success on the information possessed by the people. A broader and greater Union is advocated by our ablest statesmen, under the full sanction of Imperial authority. A national spirit is gradually growing and strengthening. Nor need the fact that the population of Canada is sprung from different races be a source of weakness. French and English and Scotch and Irish may well retain the traditions of their fathers, and be at the same time good and loyal Canadians. They may cherish the memories of the old lands, while uniting in defence of the new, in which God has blessed them with a healthy climate, a productive soil, and a free government.

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PAPER V.—ON CANADIAN LITERATURE.

BY HECTOR FABRE, ESQ., VICE-PRESIDENT.

(Read before the Society, March 21st, 1866.)

Nous avons donné à nos œuvres littéraires un titre peut-être trop ambitieux, en les désignant sous le nom de "La Littérature Canadienne". Nous prenant au mot, on a pu croire que nous avions la prétention d'entrer en lice et de nous mesurer avec cette grande et belle littérature française dont nous ne sommes au contraire que les humbles tributaires et les fidèles vassaux. Des esprits malins ont été jusqu'à insinuer que nous songions à lui créer une sorte de concurrence coloniale combinant ses efforts avec la contrefaçon belge pour avoir raison du génie français.

Une telle pensée, je n'hésite pas à le dire, ne s'est jamais présentée à l'esprit d'aucun groupe d'écrivains canadiens, encore moins a-t-elle jamais été le mobile et le but de leurs travaux. La seule ambition des hommes qui, parmi nous, se vouent au culte des lettres et s'efforcent d'élever, à côté des tribunes politiques, quelques autels ornés avec un soin pieux et où brille la flamme discrète d'un idéal accessible à toutes les intelligences, leur seule ambition, c'est que notre littérature soit l'écho affaibli de la grande voix de la France se répercutant par delà l'Atlantique, le reflet un peu pâli de son éblouissant génie. Le Canada littéraire n'aspire à être que la plus modeste province de l'esprit français, une Bretagne ou une Provence d'outremer, où, à travers une langue trahissant quelques défaites et portant la marque des luttes qu'il lui a fallu essuyer pour se perpétuer, on découvre cette force innée, cette naïveté d'inspirations, cette franchise de ton, cette originalité naturelle que les écrivains modernes ont perdues en renouvelant avec tant d'éclat et de finesse la face du monde intellectuel.

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L'esprit français, ou si l'on veut l'esprit parisien qui est la plus vivante partie de l'esprit français, est arrivé à une période où manquent, jusqu'à un certain point, les grands aspects,—car les grands et immuables aspects du monde moral ont été, avant notre siècle, mis en pleine lumière par le génie,—mais où l'ironie, la curiosité, la passion de la connaissance exacte en toutes choses, du fin mot de tout énigme, héros ou événement, l'exploration minutieuse et infatigable de l'histoire, de la société, de la nature, de l'âme à tous ses degrés, le dénigrement de l'homme par l'homme, gouvernent la littérature et couvrent ses rameaux, que l'on pouvait croire épuisés, de fruits qui charment le regard de l'artiste et dont le goût piquant et de la plus agréable amertume enivre le gourmet en même temps qu'il fait éprouver au penseur des sensations nouvelles, inconnues aux purs classiques. Les recherches de l'analyse sont poussées jusqu'aux replis les plus secrets du cœur humain, les inventions de l'esprit jusqu'aux plus merveilleuses ou aux plus bizarres conceptions, la peinture des mœurs et des caractères s'élève des plus familières images aux plus saisissants tableaux. Cette période est proprement l'époque de l'esprit, de la critique, de l'observation vraie, de la réalité transportée dans les livres, et impitoyablement peinte, impitoyablement raillée. Les vrais écrivains de l'époque actuelle, les écrivains qui résument, en des types frappants, les goûts et les tendances de la société française, ce ne sont ni des orateurs sacrés, ni des tragiques sublimes comme au XVII siècle, ni d'inimitables peintres d'imagination ou des poëtes lyriques incomparables comme dans le premier tiers de ce siècle, ce sont des critiques, soumettant à des analyses ingénieuses et savantes tout ce que jusqu'ici on avait chanté, peint, embelli, tourné en armes de guerre ou arrangé en draperies splendides. La critique est partout, dans l'histoire, la philosophie, la science, le roman, la poésie, au théâtre. Un instant l'illusion, traquée partout, n'a plus su où se réfugier. Cependant comme il faut toujours des rêves au cœur humain, la fantaisie est venue détrôner l'imagination et fournir encore à l'âme des visions gracieuses.

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Une jeune littérature, comme la nôtre, ne saurait toucher déjà et sans transition à une période aussi avancée. Elle est loin encore de la verte et spirituelle vieillesse de la Littérature Française. Ses premières œuvres viennent de naître, nos plus vieilles renommées sont voisines de nos jeunes talents, et, sous nos yeux même, plusieurs de nos contemporains se disputent l'honneur d'être les pères adoptifs des lettres canadiennes. Notre littérature ne doit pas, dans le seul but de créer ici une succursale à la littérature moderne, une sorte d'agence parisienne, renoncer tout à coup au développement graduel de ses forces à l'entier épanouissement de ses qualités natives. Nos écrivains, alléchés par le goût des imitations, le voudraient-ils, qu'ils ne pourraient, du jour au lendemain, prendre les brillants dehors et les infirmités de la civilisation parisienne.

Séparés politiquement de la France en 1760, mais littérairement dès le commencement du XVII siècle, nous n'avons point traversé les grandeurs et les épreuves qui l'ont vieillie. Nous en avons à peine contemplé de loin le spectacle grandiose et varié. Tandis que Racine écrivait Athalie ou que Bossuet prononçait l'oraison funèbre du grand Condé, nous étions occupés à nous établir sur un sol nouveau; tandis que Voltaire était au comble de sa puissance, la colonie passait sous la domination anglaise. Au moment où la révolution française ébranlait le monde et lui enseignait la liberté en quelques leçons sanglantes, les Canadiens, perdus pour la France, oubliés, commençaient une lutte obscure dont le prix devait être la conservation de leur nationalité.

L'écho de ce qui se passait en France ne nous parvenait que de loin en loin. Les livres traversaient l'Océan lentement, sans ensemble, sans suite, au hasard. Il y en avait qui ne venaient jamais, d'autres qui arrivaient bien en retard. On s'attachait naturellement aux premiers que l'on recevait, en leur attribuant une importance, un mérite qu'ils n'avaient pas toujours. C'étaient parfois des ouvrages de second ordre qui nous initiaient à un mouvement littéraire. Quelques exemplaires passaient de main en main, fesaient le tour d'une ville, du pays, et frappaient

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les esprits à leur image. Dans un pays placé dans de telles conditions, il est évident que les idées courantes devaient sortir d'un petit nombre de livres. Ce serait une étude curieuse à faire pour le nôtre que de rechercher quels sont les ouvrages qui, aux différentes époques, ont exercé une influence décisive sur les esprits. On en arriverait à reconnaître que nous en étions encore à Rousseau, à Voltaire, à Montesquieu, lorsque Châteaubriand régnait, en France, sur toutes les imaginations.

Notre séparation littéraire d'avec la France a donc été presqu'aussi complète que notre séparation politique. Nous n'avons pas plus ressenti l'impulsion des transformations littéraires que le contre-coup des révolutions politiques; nous sommes restés aussi étrangers à l'avénement du romantisme qu'à la révolution de 89. Châteaubriand a parcouru les forêts de l'Amérique, il les a remplies un instant de ses songes grandioses, son imagination y a enfanté des créations immortelles, René, Atala, Céluta, Chactas; il les a ramenées en Europe comme des beautés ravies au désert, comme les idoles de dieux inconnus. Mais ces créations immortelles étaient uniquement les filles de son génie, il les aurait aussi bien conçues dans les solitudes peuplées de ruines de l'Asie; le décor seul et les défauts sont américains. La mélancolie de René est tout européenne et il n'en a rien laissé derrière lui en quittant l'Amérique.

Ce serait donc imprimer à notre littérature un mouvement factice que de la pousser brusquement dans les voies où la littérature française n'est entrée qu'après avoir parcouru tant d'étapes diverses, que de chercher à l'initier tout à coup au scepticisme humain le plus aiguisé, au dilettantisme littéraire le plus raffiné. Elle se trouverait en désaccord complet, en mésintelligence perpétuelle avec notre société dont elle doit être l'image fidèle, la représentation exacte, si elle veut l'intéresser, si elle veut avoir des lecteurs.

Que l'on me permette une comparaison. Il y a dans la vie une époque où l'homme, après avoir traversé les beaux orages de la jeunesse, les actives et fécondes années de la maturité, est arrivé à la pleine possession de son âme et de la vie. Il se connaît lui-même tout entier et il connaît

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les autres comme lui-même. Son esprit n'a plus de surprises, son cœur de désabusements, le monde n'a point de secret pour lui. Il aime encore, il aime plus que jamais même, le spectacle des choses humaines, mais ce n'est plus l'auditeur bénévole laissant passer les fausses notes, sans les entendre, dans les flots d'harmonie que verse une belle voix; ce n'est plus le spectateur que l'on trompe avec une mise en scène habilement imaginée, avec des acteurs bien dressés, avec des figurantes trop colorées. Tandis que son regard suit la comédie qui se joue devant lui, sa pensée en voit l'envers, et il s'amuse, non de ce qu'on lui montre sur la scène, mais de ce qu'on lui cache dans la coulisse. Il aime encore la gaîté, mais celle des autres, il admire encore la beauté, mais ne croit plus à l'amour. L'espérance n'est pour lui qu'un souvenir, l'illusion qu'un enfantillage. Cet âge, qui est sans pitié, c'est la cinquantaine; et c'est là, si l'on me passe la comparaisson, l'âge de la littérature française.

La littérature canadienne est encore ,elle, dans la fleur de ses vingt ans. Elle a les qualités, elle a les défauts de l'adolescence. A voir avec quelle prodigalité s'y distribue la gloire, vous devinez qu'on n'en connait pas au juste le prix. Le moindre écrivain, en prenant la plume, fait vœu d'illustrer son pays, et avoue en toutes lettres, dans sa préface, sa funeste résolution. On parle de la postérité comme d'une voisine, bonne personne au demeurant, qui vous presse de l'honorer de votre visite. Jours heureux et fugitifs, dans la littérature comme dans la vie, où l'on prend les battements de son propre cœur pour les applaudissements de sa conscience, toutes les fleurs que l'on cueille sur les bords de la route pour des immortelles! En vieillissant, on apprend ce que durent les roses et ce que valent les livres.

Restons ainsi longtemps, jeunes, ardents; couronnons-nous de roses; cueillons la gloire à tout bout de champ, répandons-la sur tous ceux que nous aimons pour leur faire plaisir et pour qu'ils nous le rendent au centuple! Quel cruel et inutile sacrifice ce serait d'ailleurs que de changer en un automne prématuré notre tardif printemps? Pourquoi renoncer aux plus doux charmes de la vie et aux

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plus beaux jours de la littérature? Laissons nos arbres, et jusqu'aux plus frêles rameaux, se couvrir de fruits; il soufflera assez tôt le vent qui en fera tomber les feuilles! Respirons en paix l'air natal et le parfum des fleurs qui croissent dans nos champs. Réservons à la France les grandes aventures de la littérature et de l'art, les hautes entreprises, les chefs-d'oeuvre. Contents de peu, cultivons, sur cette terre lointaine, sous ce froid climat, les plantes dont le germe est dans le sol que nous foulons et dont la végétation encore sauvage éclate autour de nous.

Le rôle de notre littérature, c'est de fixer et de rendre ce que nous avons de particulier, ce qui nous distingue à la fois de la race dont nous sortons et de celle au milieu de laquelle nous vivons, ce qui nous fait ressembler à un vieux peuple exilé dans un pays nouveau et rajeunissant peu à peu. Dans ce vaste tableau de l'Amérique, qui n'est que l'image grossièrement peinte de l'Europe, nous avons une place à part, tout un coin de l'horizon. La France a esquissé les grands traits de notre physionomie nationale, mais le portrait qu'elle voulait tracer d'elle-même est resté inachevé. Depuis lors, bien des influences en ont altéré l'expression, en ont varié le caractère.

Notre société n'est ni Française, ni Anglaise, ni Américaine, elle est Canadienne. On retrouve dans ses mœurs, ses idées, ses habitudes, ses tendances, quelque chose de chacun des peuples sous la domination ou dans le voisinage desquels elle a vécu, la pétulance française corrigée par le bon sens anglais, le calme britannique déridé par la verve gauloise. La pratique suivie et régulière de la liberté constitutionnelle, notre contact incessant avec des institutions et des formes étrangères à notre ancienne mère-patrie, la cessation presqu'absolu de rapports intimes avec elle, les conditions défavorables où nous nous sommes trouvés placés, tout en laissant subsister l'air de parenté entre les Français d'Europe et les Français du Canada, la marque ineffaçable de l'origine, ont détruit la ressemblance frappante. Les Canadiens se sentent aussi étrangers à Paris qu'à Londres, car si notre langage est français, nos habitudes et nos goûts ne le sont plus.

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Il y a une grande variété d'opinions sur notre langage. Les uns, nos ennemis, soutiennent que nous parlons une langue dégénérée et appauvrie, épicée d'un fort accent Normand; les autres, les flatteurs, que nous parlons la pure langue classique, la langue du siècle de Louis XIV. La vérité est loin de ces deux excès. Ce qui distingue le langage qui a cours en Canada, c'est précisément le défaut d'accent, le manque de ton. Nous avons ôté à la langue française sa musique. Elle ne sautille plus sur le bout des lèvres, elle n'éclate plus en mille fusées oratoires. Son cours un peu nonchalant nous berce de ses monosyllabes monotones. Notre accent est celui de tout le monde, moins les procédés oratoires qui le varient. De là à parler la langue du grand siècle, il y a loin. Nous avons cependant la faiblesse d'aimer à nous l'entendre dire, quoique nous sachions fort bien que ceux qui nous font ce compliment écrasant n'en croient rien. La langue du grand siècle, la langue que parlait Bossuet dans la chaire, Racine ou le grand Corneille au théâtre, Boileau dans ses entretiens avec Lafontaine, Madame de Sévigné dans ses lettres, songeons-y une bonne fois sérieusement, pour nous corriger de cette prétention ridicule, est-ce possible? Si ces sages réflexions ne suffisent pas pour nous corriger, allons à Paris; bien des gens nous y diront: "Vous êtes anglais, vous êtes belge," personne ne nous dira—"Vous êtes contemporain de Molière.

C'est cette société, miraculeusement conservée sous certains rapports, singulièrement défigurée sous d'autres, qu'il faut peindre, si l'on veut sérieusement qu'il y ait une littérature canadienne. Son histoire, ses diverses phases politiques ou sociales, ses idées, ses mœurs, ses goûts doivent se réfléchir en nos livres comme en de limpides miroirs. Le passé, ce passé qui comprend tant d'époques diverses depuis les premiers jours de la colonie jusqu'à nos grandes luttes pour la liberté, offre mille sujets d'études. Quelles curieuses recherches à faire, quelles intéressantes peintures à tracer de la société canadienne à ses grandes époques: au début, dans les épreuves incessantes, alors que toutes les forces sont employées à dompter la barbarie; plus tard, lorsque la colonie bien assise, respire en

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paix et s'efforce de faire revivre, dans la nouvelle patrie, l'image des plaisirs et des mœurs de la patrie absente, de transplanter et d'acclimater ici une société bretonne ou normande; enfin à ce douloureux moment de la séparation en 1760, où il fallut se décider entre le Canada et la France, renoncer à jamais à revoir le pays de sa jeunesse et regarder le drapeau de la France repasser les mers, sans le suivre.

Alors s'ouvre un long drame politique dont les événements de 37 ont été l'épisode sanglant et dont l'établissement du gouvernement responsable a été le dénouement pacifique. Il y a là mille pages d'histoire à écrire. La France qui en est encore à se demander si les Français sont faits pour la liberté, trouverait la solution de ses doutes dans les longues luttes que nous avons soutenues pour obtenir les immunités contitutionnelles dont jouit l'Angleterre, dans la sagesse que nous avons déployée en nous gouvernant.

La société actuelle offre aussi au philosophe politique, à l'observateur social, au peintre d'histoire, au romancier, les sujets d'études les plus variés, les thèmes les plus fertiles. Rien ne ressemble moins à la vie civile, politique, sociale de la France que la vie canadienne. Il y a bien plus de différence entre notre chambre d'assemblée et le corps législatif français, qu'entre notre chambre et la chambre des communes; bien plus de différence entre une audience de nos cours et une audience d'une des chambres de justice à Paris, qu'entre une séance des cours anglaises et une séance de nos cours; bien plus de différence entre un salon de Québec ou de Montréal et un salon de Paris, qu'entre un salon de Québec ou de Montréal et un salon de Londres. Notre vie politique est basée sur le système constitutionnel. Les libertés anglaises s'étendent de l'arène électorale au foyer des familles, de l'administration des affaires publiques à la régie des salons. Les électeurs sont tout-puissants et les jeunes filles indépendantes comme en Angleterre. Le mariage français est fondé sur la dot, le mariage canadien sur l'inclination vraie ou supposée. Il y a dans la critique de nos mœurs, dans leur comparaison avec les mœurs françaises, dans la peinture de

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notre état social, toute une mine de piquants tableaux. Il circule à travers notre caractère une veine de gaîté gauloise dont on n'a point encore tiré assez de joyeux propos.

Il y a aussi parmi nous bien des types à créer. Ce n'est pas nous calomnier que de dire que les caractères manquent ici à la fois d'originalité et de variété, et que nous nous ressemblons tous. Il serait trop long d'énumérer toutes nos belles qualités et nos défauts un peu ternes; il me suffit de constater qu'au lieu de les réunir, en les exagérant, dans quelques êtres privilégiés, qui s'élèvent au-dessus de la foule et fixent de loin le regard, nous les répandons, en les effaçant, dans la multitude des individualités qui s'agitent confusément sur le grand chemin de la vie. Dans les pays Européens, en France surtout, chaque classe, chaque groupe a son type, qui résume ses passions, ses sentiments, ses habitudes, ses costumes, ses ridicules, et qui est comme un exemplaire de luxe d'une foule d'ouvrages inconnus. Ces types sont moitié réels, moitié inventés par ceux qui les ont peints; l'observation des romanciers les a trouvés à l'état d'ébauche dans la société, et leur imagination les a rendus au complet, avec une physionomie plus vraie que nature et contenant dans ces traits particulirs tous les traits généraux de l'espèce. La société parisienne est remplie de personnages jouant dans la vie réelle les rôles qu'ils ont appris au théâtre ou dans les romans. On voit défiler sur le boulevard des Italiens tous les types contemporains illustrés par la comédie, aussi frais et aussi ressemblants que s'ils sortaient à l'instant même de chez l'auteur de *Jérôme Paturot*, des œuvres de Reybaud ou d'Henry Monnier. Il en serait ainsi parmi nous si l'on s'appliquait à peindre les caractères, à rassembler les éléments d'une comédie canadienne, dont nous avons le plus grand besoin si nous ne voulons pas que tôt ou tard nos défauts excèdent nos qualités. Pour plusieurs de ses types, l'observation est facile et la besogne presque faite, ils sont vivants et remuants, il n'y a plus qu'à les jeter sur la toile.

Notre grande et belle nature, dans sa variété infinie d'aspects, est bien faite aussi pour tenter les brillantes imaginations. C'est pourtant le sentiment de la nature qui

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manque le plus à nos écrivains. Il y a dans *Charles Guérin* quelques larges descriptions, mais la passion qui s'attache au moindre coin de verdure, où la sent-on? Nos hivers attendent encore leur barde. Chantons nos campagnes, nos grands bois, nos chaînes de montagnes, mais, de grâce, n'y mettons que le moins d'Iroquois possible, ne réveillons pas les Hurons qui dorment. Ces naïfs et fiers héros étaient fort éloquents de leur temps et en leur idiome, mais viennent-ils à s'exprimer en langue moderne et à gesticuler en alexandrins, je les goûte fort médiocrement et ils me gâtent les plus belles choses.

Notre littérature a déjà de nobles œuvres et de gracieux ouvrages à montrer.

Notre histoires est fixée dans ses points principaux et les œuvres de M. F. X. Garneau et de l'abbé Ferland resteront comme les vrais monuments de notre passé. Nobles caractères, âmes patriotiques, dont la mémoire remplit le présent et pour qui a déjà commencé la postérité! L'un, citoyen avant tout, Canadien de la vieille trempe, de la bonne, confondant dans un même amour la nationalité et la liberté, attaché au souvenir de la France, vivant jusqu'au dernier jour dans l'espoir que ce souvenir ne s'effacera jamais de l'Amérique du Nord, et digne de garder toujours le titre d'*historien national du Canada;* l'autre, aussi grand citoyen que saint prêtre, esprit large, cœur dévoué, consacrant sa vie à élever, à côté de l'œuvre de M. Garneau, un temple où sont déposées les cendres de nos martyrs, où vivra à jamais leur mémoire bénie.

Auprès de nos historiens, supérieur à eux par l'étendue et la force de son esprit, se place le premier de nos publicistes, M. Etienne Parent, journaliste et journaliste toujours en vue pendant trente ans, ses écrits touchent d'ailleurs à l'histoire et forment la plus solide partie de nos annales politiques. Personne n'a déployé parmi nous dans ce métier de la presse, dont les conditions sont rendues si difficiles par la passion des partis, l'intolérance des intérêts personnels, l'indifférence du public et les nécessités de l'improvisation quotidienne, personne n'a déployé des vues plus larges et plus justes, une perspicacité aussi rarement en défaut, une sagesse aussi profonde.

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L'inspiration nationale a été égale du premier jour au dernier. Deux œuvres de cet éminent esprit donnent à elles seules une idée exacte de sa rare puissance et de sa haute originalité. La première a pour titre: *Du Prêtre et du spiritualisme*, la seconde: *De l'intelligence dans ses rapports avec la société.* Il y a dans ces deux lectures le résumé d'une constitution sociale admirable, fondée sur les vues les plus neuves et les plus profondes. C'est là une œuvre digne de la méditation des esprits philosophiques et dont on ne comprendra que plus tard, lorsque les études et l'expérience politiques seront plus avancées parmi nous, la valeur et la portée.

L'histoire anecdotique du passé a déjà un excellent modèle dans les *Notes* qui accompagnent les *Anciens Canadiens* et dans les *Mémoires* que va publier M. de Gaspé. Si nous possédions pour toutes les époques importantes de notre passé un témoin aussi fidèle, un narrateur aussi spirituel, nous pourrions nous tenir pour satisfaits. Soyons du moins contents de ce que nous avons, remercions le noble vieillard, qui est le plus jeune de nos écrivains, de nous avoir rendu ce qu'il a vu durant sa longue carrière avec un tel aspect de vérité, un entrain si rare; mettons dans un coin choisi de nos bibliothèques, pour les relire souvent, pour les relire chaque fois que nous nous sentirons le goût appesanti par quelque lourd bouquin ou vicié par quelque production réaliste, ces pages animées de la flamme du passé et où coule la verve d'autrefois. Ce fut un jour unique, et qui restera une date dans notre histoire littéraire, que celui où l'on vit apparaître, au seuil des lettres canadiennes, cet auteur qui débutait à 70 ans par un roman. Il n'y eût qu'un cri d'admiration lorsqu'on sentit quelle fraicheur d'imagination, quel charme de style régnait dans ce livre qui devint de suite le plus populaire de nos ouvrages.

En outre des *Anciens Canadiens*, deux romans ont fondé le genre et fixé le cadre du roman canadien, *Charles Guérin* et *Jean Rivard*. Si les deux héros de MM. Chauveau et Gérin Lajoie se fussent rencontrés dans le monde, ils eussent été amis ou parents, car, dans la fiction, ils ont un air d'intimité. Les deux histoires sont vraies, intéressantes, bien conduites, les personnages sont naturels, la

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couleur locale bonne; cependant le grand succès obtenu par Jean Rivard a fait, jusqu'à un certain point, défaut à Charles Guérin, qui avec des parties plus brillantes est inférieur à son heureux rival, comme étude exacte des mœurs canadiennes.

La poésie a été de tout temps l'objet de nos plus tendres vœux; il suffit d'ouvrir le *Répertoire National* pour voir que cette passion n'a pas toujours tourné à notre gloire. Cette compilation d'un ami maladroit de notre nationalité a voué à l'immortalité une foule de méchants vers qui se seraient contentés de l'oubli. De tout temps nous avons rimé et depuis vingt ans nous avons des poètes. Ici, je le sens, je marche sur un terrain brûlant. Il est difficile d'assigner un rang à chacun de nos poètes. Comment cependant refuser la première place à celui, dont il n'est plus permis de prononcer le nom, et qui, dans sa pièce des *Morts* et dans la première partie de la *Promenade des trois Morts*, a donné d'éclatants témoignages d'un talent si supérieur? M. Chauveau a composé un petit chef-d'œuvre, les *Joies naïves*.

Nous avons à l'heure qu'il est toute une pléïade de poètes inspirés: M. Léon-Pamphile Lemay, âme souffrante, inspiration sincère, talent énergique; M. L. J. C. Fiset, imagination charmante au vol gracieux, poète délicat au vers élégant; M. Benjamin Sulte, qui a déjà préludé sur la lyre par de mélodieux accords et qui en tirera plus tard des sons puissants; M. Alfred Garneau, versificateur brillant, ciseleur habile.

La *chanson* a été trop négligée jusqu'à l'intéressant travail du Dr. Larue et la belle publication des *Chansons Populaires du Canada*, que M. Ernest Gagnon poursuit avec un zèle de lettré et un soin d'artiste. Par cette compilation M. Gagnon a rendu à notre pays un immense service, car nos chansons forment peut-être encore à l'heure qu'il est le plus clair de notre gloire, aux yeux de l'étranger. Ce qui ne se conçoit pas, c'est notre indifférence, à nous, pour un genre si national. Nos poëtes composent des élégies et des dithyrambes; ils feraient même des poëmes épiques, si on les y encourageait, et nous n'avons point un chansonnier! Le Canadien, né joyeux, est pourtant l'ami des gais refrains. Partout où il va on l'entoure et

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on le fait chanter. Il a la voix prompte et le ton juste. Vienne un chansonnier et son nom fera, avec ses refrains, le tour du pays.

Un livre travesti et calomnié par un homme d'esprit, qui n'avait que de l'esprit, qu'il faudrait remettre à sa place dans notre littérature, c'est le *Canada reconquis par la France* de M. Barthe. Cette oeuvre éloquente a coûté à son auteur une grande dépense de talent. Un goût sévère aurait dû sans doute restreindre, dans une certaine mesure, les prodigalités d'imagination, mais il fallait un talent abondant pour répandre ainsi tant de richesses sans les compter. Un écrivain économe de ses idées, bien rangé dans ses phrases aurait tiré plusieurs livres de ce seul ouvrage. Il y a dans le *Canada reconquis* de belles et amples idées, une verve, une imagination exubérante, des passages éloquents. Mais les côtés excessifs ont effacé les bons côtés et mis l'ouvrage à la merci d'un railleur.

L'abbé Casgrain a donné dans l'*histoire de la Mère de l'Incarnation* une intéressante biographie religieuse en même temps qu'il a étalé, dans ses *légendes*, les richesses d'une brillante imagination et les charmes d'un style entraînant. Type gracieux, modèle excellent de l'homme de lettres canadien, il est l'âme de ce groupe d'élite auquel nous devons le mouvement littéraire qui s'est développé en ces dernières années. *Les Soirées Canadiennes*, le *Foyer Canadien*, que ce groupe a fondés, sont plus que de simples recueils de littérature, ce sont les promoteurs d'une ère nouvelle dans les lettres canadiennes. Avant les *Soirées Canadiennes*, nos écrivains n'avaient point encore osé arborer un drapeau séparé, distinct; ils étaient aisément confondus avec la foule des journalistes; leurs écrits étaient perdus, à la première page des journaux, au milieu des nouvelles étrangères et des correspondances locales. Des lettrés délicats, zélés, soucieux de leurs écrits, aussi soigneux de ceux des autres, dévoués à la gloire commune, amis de tous les talents, se sont réunis pour donner aux esprits diversement doués un centre intellectuel, à la littérature un organe permanent. Ils ne se sont pas bornée à éditer leurs propres travaux; ils ont rassemblé dans

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de magnifiques volumes ce qui mérite le mieux d'être conservé; ils se sont constitués les gardiens respectueux de la langue, les dépositaires des vraies traditions canadiennes.

A côté de ce groupe, ce serait une injustice, M. le vice-président (M. J. M. Le Moine), que de ne point vous nommer, vous qui rendez tous les jours tant de services à la Littérature Canadienne, qui unissez à la vocation des lettres la passion des études historiques, et qui cherchez à unir dans un même amour du passé, dans un même culte de ses gloires, les deux groupes nationaux qui se partagent le pays.

Je viens de parler, en passant des journaux et des journalistes: je ne voudrais pas m'en tenir à un mot indifférent à l'endroit d'une profession que j'aime et dont il me serait impossible de dire du mal, en eusse-je le droit. La Presse politique a été longtemps parmi nous le seul théâtre où s'exerçait l'art d'écrire bien ou mal, et c'est dans les liasses jaunies des vieux journaux, dans la poudre des polémiques éteintes qu'il faut aller chercher les plus vigoureuses traces du talent, les manifestations les plus vives et les plus variées de l'esprit. Que de luttes oubliées, que d'adversaires réconciliés, que de passe-d'armes dont les vainqueurs eux-mêmes n'ont pas gardé souvenir, que de correspondants anonymes, de journalistes improvisés qui rougiraient aujourd'hui, au sein des honneurs où le hasard les a fait monter, des méchants articles qui tuèrent leurs premiers rivaux et commencèrent leur fortune! Le journalisme est en train de se renouveler: la presse change de face et s'américanise; il ne reste guère de la vieille école qu'un dialecticien vigoureux, qui, après vingt-cinq ans de combats incessants, campe encore sur le champ de bataille. Une histoire détaillée, anecdotique de la Presse Canadienne, une collection des meilleurs, des plus piquants articles, faite par un homme au courant des secrets du métier et bien informé sur le passé, auraient un intérêt extrême. Tant de journalistes dont le talent a été décoré par l'improvisation quotidienne, qui ont vu briser leurs plumes par la haîne et la racune des partis, méritent bien qu'on ne laisse pas leurs oeuvres ensevelies tout entières dans des collections éparses, et qu'on en tire quelques bril-

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lantes étincelles de verve pour en éclairer à jamais leurs noms qu'ignorerait sans cela l'avenir.

L'éloquence a brillé de tout temps d'un vif éclat parmi nous, mais, en dehors de la chaire, il ne nous en reste qu'un chef-d'œuvre, le discours de M. Chauveau à l'occasion de la pose de la première pierre du monument de Ste-Foye. Une immense auréole d'orateur entoure le nom de M. Papineau, mais en relisant ses discours, sans doute mal rapportés, et où d'éternelles redites ne contribuent pas peu à faire paraître interminables des phrases déjà longues par elles-mêmes, on ne conçoit de son éloquence qu'une idée bien au-dessous de l'admiration qu'elle inspirait à ses contemporains. Esprit facile et brillant, M. Vallières de St. Réal a laissé le renom d'un merveilleux improvisateur. Ceux qui l'ont entendu sont encore sous le charme. La aussi sans doute il faut faire une large part aux illusions qui restent toujours attachées aux impressions de jeunesse. A l'heure qu'il est les hommes éloquents sont rares. Le talent de parler au peuple, talent fort recommendable lorsqu'il est à sa place, envahit le Parlement. On discute en chambre comme sur la place publique, non pour réfuter ses adversaires, mais pour les terrasser; et si le président ôtait la parole à tous ceux qui, sans peut-être violer les règlements de la chambre, enfreignent les règles de la politesse et les lois de la langue, les discussions finiraient bientôt faute d'orateurs. Au palais, on plaide le moins possible: il est admis qu'il n'est point nécessaire qu'un avocat sache parler; un bon nombre gagnent leurs causes en se taisant, et le jour n'est peut-être pas éloigné où l'on supprimera les audiences et où l'on remplacera les plaidoieries par des *factums*, les citations parlées par des citations écrites.

Il faut souhaiter que quelques esprits jeunes et hardis se consacrent, dans la politique et au barreau, à la réhabilitation de la forme, si nécessaire à la conservation des principes. Notre vie publique, si abaissée, retrouverait à l'instant sa dignité, si l'on exigeait de ceux qui veulent descendre dans l'arène le talent dont ils ont besoin pour y faire honneur au pays. L'art de bien dire a des charmes

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tout-puissants qui déjoueraient bien vite les grossiers artifices de la faconde démagogique. Le peuple, qui a perdu l'habitude d'admirer et qui, de nos jours, n'est attaché à aucune grande popularité comme on en voyait autrefois, le peuple se reprendrait à aimer les belles paroles, les fiers accents; il se laisserait séduire encore par l'éloquence, et de jeunes renommées s'éleveraient de tous côtés.

La tâche la plus délicate est réservée à la critique, et il faudrait pour en tenir le sceptre une main douce et ferme, un esprit qui se laissât toucher par les faiblesses du talent et qui sût cependant dire la vérité, au risque de se l'entendre dire ensuite à lui-même. Il est temps que nous mettions de l'ordre dans nos admirations, que nous fassions cesser des confusions décourageantes pour le mérite et injurieuses au talent. En voyant notre modeste fortune littéraire s'accroître à vue d'œil, les têtes les plus froides ne peuvent se défendre d'un accès d'enthousiasme; à plus forte raison les amis des auteurs sont-ils impuissants à modérer l'expression de leur satisfaction et les témoignages de leur sympathie. Il est donc sage de calmer par un peu de critique indépendante de la camaraderie et des coteries, l'effervescence à laquelle on se laisse facilement entraîner, pour peu que l'on aime son pays et ses amis. Soyons justes, soyons indulgents, n'oublions jamais en critiquant un livre que nous sommes peut-être les seuls à le lire, traitons les ouvrages des autres comme s'ils étaient les nôtres. Nous ne sommes encore qu'un petit groupe qui nous occupons de choses littéraires, et bien peu d'entre nous peuvent se vanter avec assurance d'être lus. Chaque jour, en ouvrant un journal ou une *Revue*, je fais la rencontre de grands articles qui, j'en ai l'amère conviction, s'en iront à leur dernière demeure sans être suivis par un seul lecteur. Leur sort me touche, leur solitude m'effraie pour mes propres écrits, et, réprimant un lâche instinct, je m'y mets, mais n'arrive pas toujours au bout. La grande majorité de ceux qui nous entourent est indifférente à nos émotions littéraires et ignore, plus que je ne puis le dire, nos oeuvres et leurs pompes; travaillons tous ensemble à nous créer des auditeurs et, en attendant

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qu'ils nous viennent en foule, entre-lisons nous avec sollicitude et indulgence.

Un écueil que la critique doit éviter par-dessus tout, c'est l'écueil des rapprochements indiscrets entre nos écrivains et ceux de l'Europe. D'ordinaire nous ne sommes tranquilles et satisfaits que lorsque nous avons vu accolés à nos titres de gloire des noms qui les écrasent. Il nous semble qu'il manque quelque chose à la noblesse littéraire de nos auteurs lorsque, à la suite de leurs noms ne brillent pas les noms de Lamartine ou de Châteaubriand, dont la sonorité éclatante contraste avec le son un peu sourd des célébrités qu'ils escortent et le bruit léger des renommées qu'ils accompagnent. Fuyons ces rapprochements inégaux, ces comparaisons odieuses et blessantes lorsquelles ne sont pas extravagantes.

Ainsi exercée la critique ne saurait décourager aucun talent sérieux. Elle ne peut au contraire qu'établir les degrés et fixer les nuances.

La critique européenne parfois vient nous atteindre. On ne saurait mettre en doute son impartialité, l'intérêt sincère qui l'anime à notre égard, car, à quelque point de vue que l'on se place, il est évident que nos écrivains ne portent point ombrage à ceux de la France. Nous tenons tant cependant aux éloges d'outremer que plus d'une fois nous avons fait preuve d'une susceptibilité trop vive. Nous nous sommes piqués de la persistance et de la chaleur que l'on mettait à nous féliciter de notre vieux style, nous avons pris pour une injure ce qui n'était qu'un compliment immérité. Mais ce qui nous irrite surtout, c'est le silence que la critique européenne garde le plus souvent à l'endroit de nos œuvres. Quelques uns d'entre nous en éprouvent un dépit extrême et une aigreur mal dissimulée contre la France. Nous aurions tort pourtant de voir là un signe de dédain, une marque d'indifférence absolue. C'est seulement que nous ne sommes point encore parvenus à frapper un grand coup et à imprimer un choc au vaste monde littéraire dont nous voulons maîtriser l'attention. Présentons à ses regards des œuvres originales et nouvelles, des conceptions qui l'étonnent, des tableaux

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qu'il n'ait point déjà dans ses galeries, et nous le verrons se tourner à l'instant de notre côté. A la lueur de ces éclairs, il verra toutes nos œuvres encore obscures, il reconnaîtra cette littérature, fille de la sienne.

C'est là le but que doit poursuivre la littérature canadienne; tôt ou tard elle l'atteindra, elle aura un chapitre dans l'histoire de la littérature française. La Nouvelle-France prendra, au-dessous de l'ancienne, dans le monde intellectuel, une place égale à celle qu'elle a perdue dans la sphère politique; elle redeviendra encore une fois sa colonie, lui apportant comme un tribut de reconnaissance un surcroît de gloire.

Sujets anglais ou citoyens d'un Etat libre, nous resterons à jamais les compatriotes de Corneille et de Bossuet, de Châteaubriand et de Lamartine, les lecteurs assidus, les admirateurs passionnés de tant de chefs-d'œuvre, les humbles émules de tant de brillants écrivains. Un jour, nous aurons notre place à ce foyer qui éclaire le monde et parfois l'incendie, et réveillant nos pères, ceux qui ont honoré le pays par leurs actions et ceux qui l'ont honoré par leurs écrits, nous demanderons à la France de leur ouvrir son Panthéon. Dans l'avenir, on verra à la suite des grands hommes qui ont illustré la mère-patrie, les généreux écrivains qui auront conquis au Canada une place dans le monde des lettres.

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PAPER IV.—ON SOME OF THE FISHES OF THE ST. LAWRENCE

BY F. W. G. AUSTIN, ESQUIRE, ADVOCATE.

(Read before the Society, April 4th, 1866.)

FISHES are described as vertebrated animals, with cold red blood, breathing by gills through the medium of water; without lungs; body covered with imbricated plates or scales or with a smooth mucous skin. They propel themselves in water by means of fins instead of feet, which vary in number. They are chiefly carnivorous. Fishes are divided by naturalists into two great groups, viz., the bony, such as the perch family; and the cartilaginous, such as the sturgeon. These again undergo subdivisions and classifications too numerous and technical to define on the present occasion. Some kinds are also known as mammalia, and partake both of the nature and habits of fish as well as of terrestrial animals. These produce their young alive, such as the whale.

There are two or three species of shark which affect or visit the Gulf of St. Lawrence. The thresher shark, which is one of them, is so called from the use it makes of its powerful and flexible tail, with which it literally threshes its enemies. This fish is a great enemy to small whales. In its attacks it is most persevering; and the whale may be often seen to leap quite out of the water and make the sea foam from the torment he endures. The basking shark in a formidable fish, of a dark slate colour, possessing, according to Dr. Storer, fourteen hundred teeth in the lower jaw alone. He inhabits the northern seas, but occasionally visits the American coast. His great size, and his habit of swimming near the surface with his upper jaw out of the water, has, according to DeKay, suggested the idea of the sea-serpent. A fish of this kind is said to have been captured in the Bay of Fundy, forty feet long. The tail was seven feet nine inches broad; the

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head five feet across; the mouth three feet wide; the liver yielded 320 gallons of oil. This large quantity savours strongly of a sea-serpent story.

The whale fishery which is carried on in the Gulf, yielded, in 1864, $17,000 worth of oil. The whale fishery of the Gulf, according to Sir Richard Bonnycastle, was formerly of great value, and employed a good many large schooners. The species caught within the Gulf of St. Lawrence are called "humpbacks," and produce about three tons of oil each. The mode of taking them is somewhat different from that followed by the Greenland fishermen. An active man accustomed to boats and schooners, may soon learn the mode of carrying on the fishery. Schooners from seventy to eighty tons burthen, manned by eight men, are employed. Each schooner has two boats twenty feet long, narrow and sharp, with a pink stern, 220 fathoms of line to each boat, spare harpoons and lances. The whale is approached by the men using paddles to make less noise. Whales are sometimes captured in fifteen minutes after they are struck with the harpoon. The largest are taken off the entrance of Gaspé Bay and on each side of the Island of Anticosti. A pretty fish, inhabiting the shores of the St. Lawrence, and which from its extreme diminutiveness forms a striking contrast to the great leviathan of the Gulf, is known by the name of stickleback. Of these there are two or three varieties. These little creatures, which are not often longer than three inches, are armed with sharp spines ranged along the back. One kind has fifteen of these spines, another ten, and the last three. The stickleback family are amusing, lively little creatures, though very pugnacious. They are said to possess the faculty of changing their color. When in a quite healthy state and not frightened, this fish is of a rich olive-green above, and silvery white below, with a golden band along the sides, as if it had been covered with burnished gold; but when unwell or alarmed, all the bright colors vanish, and the creature changes to sober grey, brown and white. It is a voracious fish, devouring great quantities of molluscs, worms, and little crustaceæ.

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The sticklebacks are of domestic habits, and not only stay at home, but build their own houses. The nest of the stickleback is a very curious affair, and is constructed like that of a bird. The nest of the three-spined stickleback is made of hay and sticks, generally of the same color as the ground on which the nest is placed; it is about as large as a walnut, and has a cavity in which the tiny eggs are laid. These eggs are not larger than poppy seeds, and of a bright yellow color. The fifteen-spined stickleback has been known to weave its nest out of the loose strands of an old rope found in the water. The stickleback is very careful of its nest, always remaining close at hand, and will charge any creature that approaches its castle.

The Magdalen Islands, situated at the mouth of the Gulf, are important fishing stations. They were frequently visited by French vessels after the discovery of Canada. The Magdalen Islands were conceded, in 1663, by the Company of New France to one François Doublet, of Honfleur, who associated himself with Gon de Quimé and Claude de Landemare for the purpose of trading and fishing. These Islands, it is supposed, reverted again, in 1719, to the French government, as, according to Charlevoix, they were conceded to Lecompte de St. Pierre. In 1763 they fell to the British; and were inhabited by a few French and Acadian families, who lived by fishing for the walrus, an amphibious animal, now extinct in the waters of the St. Lawrence. An American gentleman, named Gridley, founded on Amherst Island a trading and fishing establishment. He took into his service several families of French origin residing upon the Islands, to carry on, upon a large scale, the hunting of the walrus and the seal, the oil from which found a ready market in the New England colonies, as well as the skins, from which a thick leather was manufactured; the tusks of the walrus were used as a substitute for ivory. Gridley's establishment was destroyed by the privateers of the revolted colonies during the American war. After this was over, he resumed his occupation. The walruses, however, which resorted to the beach in herds, were subject to incessant at-

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tacks from the fishermen, or rather from the hunters, to whom they were of great value. A number of fishermen, after the conquest of Canada, came from the English colonies to engage in walrus hunting. They carried it on with such perseverance and energy that the extinction of this fine animal, second only in value to the whale, was very soon accomplished. For this brief sketch of the Magdalen Islands, and the walrus fishery, as well as for other information, I am indebted to the Reports of Commander Fortin, the officer in charge of the Gulf fisheries; and it is due to Commander Fortin that I should state, and I have much pleasure in doing so, that that gentleman has largely contributed to the cause of science by describing and classifying over sixty species of the fish of the Gulf.

A fishery of much value to the hardy population of the island and coasts of the Gulf, is the seal fishery. The seals are found in the spring of the year, upon fields of ice, in large herds. They are stunned by blows from clubs, and sometimes obtained by shooting. When the ice is closely packed together, and there are no open spaces to admit of the escape of the seal, a rich harvest repays the severe toils of the hunter. High winds blowing from the same quarter drive the fields of ice, covered with seals, towards the shores, and keep them aground near the coast until a change of wind takes place. On such occasions great prizes fall to the hardy islanders. The approach of the ice-fields, laden with seals, is the signal for the greatest excitement among the whole population. In a short time the news is spread all over by the ringing of bells and the firing of guns. There is a general rush to the shore. Young and old men, each armed with his knife, a rope and a club, spring out on to the fields of ice; while the women remain on shore, within reach, to prepare refreshment and supply warm drinks to enable the men to resist the damp and cold to which they are exposed. With the clubs the seals are stunned, when the knives are employed to despatch them and to remove the skin and blubber. When the harvest is large enough, the spoils are tied together with the rope

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and dragged from one field of ice to another until the shore is gained, when the men return for a fresh supply. This fatiguing labor continues throughout the whole day, and even during the night in clear weather, so long as the seals remain and can be got at. During the season of 1864, $18,000 were earned in three days by this industry. It is needless to add that this kind of hunting upon fields of ice is attended with great danger; for should the current or the wind detach the ice from the shores before the hunters regain the land, if not reached by boats they are carried off to sea, there to perish miserably of cold and hunger. Such accidents have frequently occured.

The chief fishery of the Gulf is that of the cod, which commences early in June and continues until the end of November. It is prosecuted in almost every part of the Gulf. The mode of capturing these fish generally resorted to is by hand-lines of from thirty to forty fathoms in length. Each man has two lines, with spare leads and hooks. The fishermen go out in boats. The hooks are baited with herring, caplin, or other small fish, which the cod pursue and prey upon; and so soon as these fish appear on the coast the cod fishery commences. The squid, a strange-looking mollusc, is also a favorite bait for the cod. The success of the cod fishery depends greatly upon the numbers of small fish to be found on the coast. A most improvident use is made in many places of the herring and the caplin, a small fish of the salmon family, by taking them in immense numbers for the purpose of enriching the soil upon which they are spread; these small fish, with several other kinds, have been devoted to this purpose without intermission for the greater part of a century. This cannot fail to have a most injurious effect upon the cod and other fisheries, as it is impossible thus to disturb one operation of nature without upsetting several, so harmoniously blended are the works of the great Creator. The Reports of Commander Fortin, the officer appointed to protect the fisheries of the Gulf, inform us that wherever the bait fails the cod fishery is defective. It has long been remarked, in many places, that owing to

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this waste of the smaller fish—the sustenance of the cod—that the cod fishery recedes as agriculture advances. The farmer who thinks he can increase the fertility of his land by making such a use of the small fish, does so at the expense of the fisheries; although a bountiful Providence has placed within his reach inexhaustible quantities of kelp, sea-weed, and other valuable ingredients, which would really enrich the soil, while it is admitted that the use of fish much deteriorates it. Colonel Rhodes, a scientific agriculturist, has tested the value of fish as a fertilizing agent, and found that it did not answer, particularly for the cultivation of green crops, and abandoned the use of it. Strenuous efforts have been made to prohibit the waste of the smaller fish of the St. Lawrence for this ignoble purpose, but hitherto without success. A prohibitory law existed in 1824; this law has been repealed, and no other equivalent provision has been enacted, notwithstanding that this subject has been brought prominently before the authorities having charge of the fisheries. In 1864, 5,110 barrels of herring and other fish, suitable for human provision, was wasted on the soil in the county of Bonaventure alone. Towards the close of that season the charity of the benevolent was solicited, and a government steamer, laden with clothing and provisions, despatched to the lower St. Lawrence to save suffering fishermen from starvation.

On the return to shore of the fishing boats from the grounds where the cod is taken, the boats are run along side stages, built over the edge of the water; upon these stages the fish are thrown out. The first man that handles the fish cuts its throat with a stroke of his knife, and slides it along a table to another, who removes the head and drops it, with the other refuse, through a hole in the table, retaining, however, the liver from which the cod-liver oil is made; the next man splits the fish and takes out the backbone. On the nicety with which these operations are performed the quality of the fish for market mainly depends. They are then washed and rubbed with salt, in which they remain for a few days; they are then again

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washed and placed in a pile to drain; after draining for twenty-four hours they are spread out to dry on frames or stages, called "flakes." The fish should be frequently turned,or else they may become "saltburnt." They cure in about three weeks. When sufficiently cured they are laid in small circles, with the tails outwards; these circles are continually built upon, each row being larger than the one below it, until the pile is about three feet high, when the circles begin to diminish so as to form a conical roof; this is covered with birch bark, and stones are placed upon it. The piles are thus secured from the rain, and the fish are left to season before being packed for exportation. In 1864 the total value of this great source of Canadian industry, which cannot be too carefully husbanded, was $621,122. I must leave to the faculty, the task of expatiating on the uses and virtues of cod-liver oil, and content myself with a nicely garnished cod-head and shoulders—a dish on which even *Punch*, the prince of gastronomers as well as of wits, descants in the following stanzas:—

I.

"When round the Busy world we scan,
And learn each human wish,
We surely never find a man
Who'd dine without his fish.

II.

Though some may praise the tender sole,
Or choose the trout instead—
They may be right, but, on the whole,
Give me my prime cod's-head!

III.

With parsley garnished gaily round,
And laid on china dish;
Complete with butter and with sound—
Sure 'tis the King of fish!"

The herring is perhaps, in a mercantile aspect, the fish next in value and importance to the cod. It is a native fish which breeds along the shores of the lower St. Law-

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rence, and disappears after spawning time, either by returning to the sea or sinking into the depths of the river; a few, however linger on the coast during the whole season; it approaches the shores in dense shoals. The naturalists, DeKay and Storer, assert that our species differs materially from the herring of European waters, and have distinguished it from the latter by the name of *clupea elongata;* the fishermen designate this fish by the name of "blue back." Scotland and Holland are famed for their herring fisheries; indeed, herring fisheries have been appreciated by all maritime countries. The editor of Baron Cuvier's Natural History of Fishes, thus alludes to the herring fishery: "The coffee-bean, the tea-leaf, the spices of the torrid zone and the silk-worm have less influence on the wealth of nations than the herring of the northern seas. Luxury and caprice may seek those productions, but necessity requires the other. This fishery sends every year numerous fleets to collect from the depths of the stormy ocean an abundant and certain harvest, which the vast shoals offer to the courageous activity of different nations. The greatest statesmen, the most intelligent political economists, have looked on the herring fishery as the most important of maritine expeditions. It has been called the great fishery. It forms robust men, intrepid mariners, and experienced navigators. The nations industriously occupied in this fishery know how to make it the source of inexhaustible riches." In well-regulated European fisheries, the herring is captured by an instrument known as a drift-net. In the second volume of Yarrell's History of British Fishes, it is stated "that the proper mode of fishing for herrings is by drift-nets, but, whether in deep or shallow water, the nets are only in actual use during the night. It is found that the fish strike the nets in much greater numbers when it is dark than when it is light; the darkest nights therefore are the most favorable. Nets spread in the day time alarm the fish, and cause them to abandon the places where that practice is followed." Mitchell, a recent writer on the natural history and national importance of the Herring, also asserts "that fishing during the day time for herrings should be prohibited, as

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it drives away the shoals." The same doctrine is laid down by Mr. Perley, in his Report on the Fisheries of the Bay of Fundy.

The inhabitants on the shores of the St. Lawrence capture these fish at all times, as well by day as by night, in brush fisheries attached to the shores; the fishermen sell them generally in a fresh state in the country parts, and some are brought to our markets. Extensive herring fisheries are carried on in the Bay of Fundy and in many other places. The brush-weirs are supposed to be most injurious to this fishery, as they are constructed in the course of the fish when approaching the shores to deposit their ova. Fishing for herrings in the day time, as has been already stated, drives away the shoals; besides, the weirs destroy a great quantity of the fry or young every season. Cochran Craig, Esquire, a magistrate who resided at Grand Manan, represented to Mr. Perley, when visiting the fisheries of New Brunswick on behalf of that Province, that he considered the extent to which the herring fisheries were injured by the destruction of herrings, both fit and unfit for proper use, taken in the weirs, to be almost endless; the heavy shoals of herring fry being yearly cut up by the weirs, and the cod having no bait to draw them in shore, they were only to be found out in deep water, where boats and small vessels—the poor man's dependence—could not follow them. Bouchette, in his History of Canada, alludes to the quantities of herrings which, at the time he wrote, affected the shores at the Eboulemens; these fish were at the same time found in great numbers on the opposite coast,—but they have entirely disappeared from both places, to the great loss of the inhabitants. Their disappearance was no doubt caused by the number of weirs in use both day and night. In the Bay of Fundy quantities of herrings were formely cured by smoking: they were styled by the fishermen "Digby Chickens." Large quantities of herrings are still caught in the Gulf; these are salted and packed in barrels for commerce. In 1864 the herring fishery realized about $55,000.

Another fish which annually ascends the shores of the

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St. Lawrence, and constitutes an economic element with which we are all familiar, is the shad. A few years ago this fish was very abundant, and could be furnished in the fresh state at a very low price; it has not been quite so plentiful during the last few years. In alluding to the decline in numbers of this valuable fish, I shall merely cite the opinion of a gentleman engaged for many years as a Missionary among the fishermen of the Bay of Fundy, where these fish formed an important object of trade:—"Standing weirs and standing nets are unquestionably the most effectual means of destroying shad altogether in our bays, or at least of thinning their quantity to an incredible degree; both ought to be discontinued at once and prohibited by strict laws. My reasons," asserts the writer, "for condemning both modes are, first, that by a standing weir shad of all sizes are stopped, and those that have hardly attained half their natural growth are either left to perish on the mud-flats or else are cured pell-mell with the larger ones. I have seen with my own eyes what I here mention." The Reverend gentlemen reiterates his suggestion that both weirs and standing nets should be prohibited by law, as being destructive to shad and very injurious to fisheries and to commerce. The shad of America is said, by Wilson and Dr. Storer, to differ materially from the shad of Europe. It feeds upon the shrimp and the shad-worm, and loses its fine flavour after being some time in the fresh water; it affects muddy shores where its food is abundant, and sometimes attains the weight of six pounds. The mode of fishing recommended to obtain a supply of this fish for consumption is by drift-nets, as these do not form the same obstacle to the growth of the fish as the standing engines. No reliable statistics of the annual value of the shad fishery are available.

The American fishermen derive large profits from the mackerel fishery of the Gulf; these profits may be interfered with by their exclusion from the coast fisheries, which they have enjoyed under the Reciprocity Treaty which has recently ceased to exist, as the convention of the 20th October, 1818, revives. The law officers of the Crown, in

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interpreting the convention of Great Britain with the United States of America, are of opinion that, by the terms of the convention, American citizens are excluded from any right of fishing within three miles of the coast of British America, and that the prescribed distance of three miles is to be measured from the headlands, or extreme points of land next the sea, or the coast, or of the entrance of bays or indents of the coast; and consequently that no right exists, on the part of American citizens, to enter the bays of Nova Scotia. there to take fish, although the fishing, being within the bay, may be at a greater distance than three miles from the shore of the bay—as the term "headland" is used in the treaty of 1818 to express the part of the land above mentioned, including the interiors of the bays and the indents of the coasts. The convention did not, according to the opinion of the Queen's Advocate-General and the Attorney-General of England, concede a right to any foreign country of navigating or using the passage of the Gut of Canso. Casting bait, to lure fish in the track of American vessels navigating the passage, would constitute a fishing, within the negative terms of the convention. American citizens have no right to land either, or fish from or conduct a fishery from the shores of the Magdalen Islands. The rights of fishing ceded to the United States, and those reserved for the enjoyment of British subjects, now depend altogether upon the convention of 1818, which is the only existing treaty on this subject between the two countries. The manner of fishing for mackerel pursued by American fishermen is described in Perley's work on the Fisheries of the Gulf, but is rather too lenghty to explain now. This fishery is worth a large sum of money annually to the American fishermen. Canadian fishermen do not appear to understand the importance of the mackerel fishery, and do not engage in it to the extent they ought. The produce of this fishery to this Province in 1864 did not much exceed $28,000.

There are other fisheries carried on in the Gulf, which, however, are of minor importance to those alluded to; they are the haddock, hake, halibut, tunny, smelt, and sar-

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dine fisheries. Oysters, lobsters, and other molluscs and crustaceæ are to be met with in many parts of the Gulf in great abundance.

The common lobster is too well known to need any description; he is plentiful on many parts of the coasts, sometimes ascending the St. Lawrence as high as Tadousac. The fishermen are accustomed to insert a peg of wood into the joint of the lobster's claw, to prevent it from wounding them; this is a most cruel process, and is most injurious to the lobster, causing it to pine away, lose weight, and become unfit for food. Fishermen should be forbidden to use pegs, and compelled to tie the claws or forceps with a string. When the lobster is alive and well, its color is nearly black, in some cases having a deep green tinge. But when boiled, or put into spirits of wine, the color changes to red.

To overrate the value the fisheries would be to Canada. under a stringent system of protection and management, would be almost impossible. The British fisheries have become—since the scarcity of other food caused by the cattle disorder, which is still marching onwards—the principal source from which subsistence is obtained by the masses of the English people; and it is a blessing to know that so productive are the waters which surround the British coasts, that this vast resource is not likely to fail. A report published by men of science and experience, among whom was Professor Huxley, at the begining of the present year, on the deep Sea Fisheries of England, affords an insight into the magnitude of this resource, which is capable of supplying not only the metropolis, but the entire United Kingdom. The most frequented fishing grounds are more prolific of food than the same extent of the richest soil: once in the year an acre of good land, carefully tilled, produces a ton of corn, or three hundred weight of meat or cheese; the same area at the bottom of the sea, on the best fishing grounds, yields a greater weight of human food every week in the year. The city of London annually consumes 90,000 tons of beef, and an equal quantity of fish produced by the neighboring waters. The immense

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consignments of herrings—the large catches of salmon —the tons of other fish, which arrive daily in the English markets, are astonishing. The consumption of fish-food is prodigious; the supply, nevertheless, is constantly at hand.

Besides the deep sea-fisheries of the Gulf, Canada possesses, in the St. Lawrence, the link connecting the great lakes of the West with the salt of the ocean, joined in its downward course by more than seventy tributaries, including the Ottawa and the Saguenay and their several branches—a field for the cultivation of fish unrivalled in the known world. When the continent was first peopled, this vast fish-farm formed the rich pasture ground of untold numbers of the finny race. The salmon family roamed throughout this vast domain, extending from head waters of Lake Ontario to the extremity of Labrador, in incredible numbers. Most northern regions, in the earlier periods of their history, were famed for their enormous supplies of these interesting fish. So abundant were salmon at the mouths of certain rivers of Boothia Félix, that 3,378 were captured in a single haul. Sir George Simpson found them so plentiful in the Columbia river, that as many as, 1,000 were daily captured in a basket. A stream in Russian America was so full of salmon, that the ascent of it in a canoe was impeded by their numbers. 3,000 barrels of these fish were annually shipped from the Restigouche. The north shore formerly supplied them in immense quantities. Up to the year 1842, this part of the St. Lawrence was literally teeming with salmon. The Hudson's Bay Company used to export thousands of barrels. "I used to see them so numerous," asserted a member of the Legislature, "that, when a boy, I killed them with stones." These localities are now nearly deserted and barren. There are several species of the salmon family inhabiting the waters of this Province: *salmo fontinalis*—the brooktrout; *salmo ferox*—the great grey trout; also the *lunge*, or long-finned trout, and the salmon—*salmo salar*. Some of these species are migratory; even the brook trout, when in its power, descends to

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the sea and returns to perpetuate its kind in the coolest and most limpid waters. There is but one distinct species of the brook trout, though the same fish inhabiting different waters, according to Agassiz, is affected by the color and quality of the water; trout even in the same river vary in color accordingly as they haunt the shady or sunny side of the stream. The fish of streams rushing rapidly over pebbly beds are superior, both in appearance and quality, to those of ponds or stagnant pools. The *salmo ferox* is found in the large lakes, and sometimes reaches the weight of 25 lbs., and corresponds in description with the *salmo ferox* alluded to by Yarrell in his work on British Fishes. The *salmo trutta* found in this Province, and which ascends the fresh-water rivers from the sea like, the salmon, possesses the same habits as the species found in European rivers, and described by Sir W. Jardine. The *salmo canadensis*, and the *lunge* are alluded to by American naturalists, and are supposed to be a well-defined species. *Salmo salar*--the salmon--is a well-known fish; as in Europe so in America, it has been long supposed that there is but one species, though American naturalists affect to have discovered three kinds in America. The salmon of Europe and that of America is believed to be the same fish identically: all kinds, should more than one exist, are marked by the same general characteristics. The salmon is born and nursed in fresh-water streams; the female casts her ova on a gravelly shoal over which a current gently flows, forming a bed by making a shallow trench in the gravel, which she afterwards fills up and covers the ova. The autumn is the time of the year chosen, when the water is about 10° above freezing; the water requires to be pure and highly oxygenated, by falls and the rapidity of its course. The young emerge from their stony couch in about one hundred days, and swarm in the stream; they attain the length of an inch and a quarter in a couple of months, and are then called parr, and are easily recognized by their silvery scales and dusky grey bars crossing the lateral line,--they, however, resemble small trout, having red spots on the sides. They grow very slowly for a

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few months, but when they attain six or seven inches in length, which about one-half do in a little over the first year of their existence, they undergo a rapid change— the dusky bars and red spots disappear, and they assume a bright silvery appearance, and bear some resemblance to a salmon. They are then called smolts, and descend to the sea. The next season, the half that remained in the river as parr, assume the bright silvery appearance, and, in their turn, descend to the sea. Some return, in two or three months from the time of their migration to the sea, back to their native river as grilse, weighing from three to eight pounds each. So rapid is their development in salt water, that they attain over a pound in weight during every fortnight of their stay, and become marketable fish in about twenty months from the time the ova was deposited in the gravel. They do not all return from the sea the first year; about one-half continue in the salt water until the following season. It appears to be a natural law for these fish to ascend to and return from the sea by double or divided migrations—one half the brood during one season, and the other half during the following year.

A prominent feature in the migration of these fish to and from the sea is, that they always—to use a nautical phrase —"hug" the shore on their way up and down. They do not, asserts Mr. Russel, in his work on the Salmon, lie off in mid ocean, and then, as with a needle and compass, steer right into the river's mouth; but they feel, or, as Sir Humphrey Davy expressed, scent their way along the shore for many miles and follow closely the indents of the land. There appear to be wise reasons for this habit of the fish in pursuing a course along the shores: enemies which would prey upon them are thereby avoided, and they find their natural sustenance, the smaller kinds of fish, along the shores near the land. It is a habit of the salmon, also, to make the coasts of the sea their highway; and this coasting disposition being known to the fishermen, according to Yarrell they project their nets in such places as are most convenient for intercepting them in their course from the sea to their native rivers and favorite breeding grounds.

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In 1860 the British salmon fisheries, owing to the use of stake-nets, were in the same depressed condition in which we now find those of Canada, which have declined to such an extent that many rivers where salmon formerly abounded, do not now contain the vestige of a fish. In that year a Royal Commission was issued to enquire into the subject, at the head of which was Sir William Jardine, the eminent English naturalist. These Commissioners reported to the House of Commons, in 1861, "that the stake-nets were opposed to the whole aim and spirit of the fishing laws; that these engines were baneful to the fisheries, not only on account of the numbers of fish they destroyed, but also because they scared and drove them away to sea when they came in shoals seeking the rivers, thereby exposing them to be injured and destroyed in a variety of ways." This system of fishing was accordingly prohibited by an Act of the Imperial Legislature, based upon Sir W. Jardine's report; and three years afterwards the fishery officers for England and Wales reported "that all round the coast the fisheries yielded an unusual return, and the fishing grounds also contained a number of fish hitherto unknown. On the west coast, and on the east, in the north, and in the south, there was scarcely a river where salmon could be found in any numbers in 1860, that was not becoming of importance to the public; or one where salmon then existed, that did not give sure promise that it wanted but care and time to take its place among the market-supplying waters of England." Thus in three years the salmon fisheries of England and Wales were, by timely and prudent legislation, restored to a productive condition; and the people, during the ravages of a rinderpest unparalleled in intensity, are deriving the greatest benefit from this wise foresight.

The engines employed in the salmon fisheries of Canada are very similar to those abolished in 1861, as too destructive to the English fisheries; the official reports of Canadian fishery officers will establish with what pernicious effects. In 1861 the yield of salmon on the Gaspé coast was 688 barrels; in 1864 the yield was only 513 barrels; in

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1860 the north shore, covering 510 miles of coast, produced 1,689 barrels of salmon; in 1864 the yield was only 1,-169: showing a decline in both sections of 665 barrels, notwithstanding a large annual expenditure of public money in the protection of the fisheries. The same causes which decreased the salmon fisheries of England and Wales are now injuring those of this Province; Commander Fortin confirms the opinion of the Royal Commissioners in their condemnation of the stake-nets as fishing engines, when he alludes, in his Report for 1864, to the fish escaping from the nets bearing, in many cases, the marks of more or less serious wounds, of which many die and are lost to mankind. A certain number, he adds, no doubt, when recovered of their wounds, re-appear in fresh water, but generally, it is said, in a different river from that in which they have been wounded. This year nearly all the first salmon taken in the Kegashca river bore marks of wounds on the front part of the body, evidently caused by nets, and were not of the same kind as the fish of that river. They came, he concluded, from the Natashquan, where they had striven, without success, to overcome the numerous nets set at its mouth, as they bore clearly defined marks on the head, back and breast, of the nets they had broken through. Every river in the neighborhood of this city where salmon are taken, affords confirmatory evidence of the assertion of Commander Fortin, as wounded fish are constantly captured in them. Engines which inflict wounds upon the fish, scare and drive them away to sea, and thus deprive them of access to their native rivers and favorite breeding grounds, are unfit to be used in our salmon fisheries. The same reasoning applies to all other kinds of fish affecting the shores of the St. Lawrence: and until these pernicious engines, now prohibited in the fisheries of England, and to a great extent in those of Ireland and Scotland, are banished from our coasts and estuaries, the extensive field Canada possesses, for the creation of food and wealth for her people, can never be effectually developed.

[NOTE.—As well shortly previous, as subsequent to the reading of the above paper, the subject of the employment of stationary nets,

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and their effect upon shore and river fisheries, was elaborately discussed in some of the leading journals of the Province. The discussion served to establish that these engines are most injurious to the fisheries in which they are used. The editor of the London *Field*, whose opinion, throughout the British dominions, is recognized as authority upon such matters, in alluding to this discussion, writes, in the number of that journal of the 7th last: "If you want to destroy a salmon fishery, poach it, leister it, net it, and rod-fish it as hard and as long as you like, and you cannot do it; but lock the salmon out by means of fixed nets, and the thing is done forthwith. The fish cannot breed, and there is an end of him.This result is so plain, so manifest, that it is one of the most wonderful things, even in an age when rapacity and chicanery abound, to find any one so blinded by short-sighted greed as to defend a system which is so atrociously unnatural that no one ever dreamt of applying it to any other part of the creation." In the number of the same journal of the 19th May last, the editor further observes, "we need not inform our readers either in Canada or here, that we have always condemned such engines utterly and without any reservation whatever." Russel, at page 193 of his admirable work on the Salmon, acquaints us, that it is the nature of the fixed engines on the coasts "to operate in deterring, and obstructing, as well as in capturing; and they so operate in a more injurious way than the similar causes operating in rivers, when salmon are stopped or frightened back within a river; it is generally speaking only a matter of delay and return; but in the sea, the fish stopped by the standing nets, if they escape capture, are driven out among their natural enemies, the seals and porpoises, who systematically wait outside for the chance." This was strikingly exemplified at the Tadousac salmon fishery during the season of 1864, when the fixed machinery planted on the shore, by changing the course of the fish striking it, attracted a large whale and a number of seals to prey upon the straggling salmon. The actual decline in the product of our salmon fisheries between the years 1861 and 1864, both inclusive, is stated by official documents (the last published) to have exceeded in money value $10,000; and this large sum is, of course, entirely apart from the expenditure involved in their protection during the same period.]

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PAPER VII.—ON THE BIRDS OF CANADA.*

BY J. M. LEMOINE, ESQUIRE, VICE-PRESIDENT.

(Read before the Society, April 25th, 1866.)

MR. PRESIDENT.—My young friends: I shall to-night briefly direct your attention to a study, which no doubt to the majority here present has proved ever since their boyhood an unfailing source of pleasure, and which I have no hesitation in saying will afford increased gratification the more it is followed. No season of the year appeared to me more propitious for bringing under your notice the feathered race than the period of the spring migration—than those lovely April mornings, when the gardens, the fields and the forest resound with the soft melody of hundreds of winged choristers. Natural history, in all its branches, has ever been reckoned a most attractive subject; it is, however, a study so comprehensive that I find myself to-night under the necessity to take up one department only: let it then be the most interesting.

We shall spend a social hour, and hold contact with the friends of your youth and of mine—the *Birds:* nor need you doubt me when I tell you that it is not in the spirit of exact science, nor with the pedantry of a professor, but rather with the freedom of an old acquaintance that I shall to-night introduce to you some of the denizens of the woods and minstrels of the grove—so correctly styled "the accredited and authenticated poets of nature." Do not, then, expect a set discourse on ornithology. Stray jottings—rambles amongst birds and books—that is all I can promise you at present.

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*The substance of this paper was delivered as a lecture, for the benefit of the pupils of the High School and other public institutions, and for the avowed object of making known the contents of the Museum of the Society. The lecturer, well known by his French work, "*Les Oiseaux du Canada,*" also furnished several specimens from his own extensive museum at Spencer Grange.

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That branch of zoology which treats of birds is denominated ornithology, from two Greek words—ορνιθος, a bird, and λογος a discourse—a discourse on birds—the history of birds. It is beyond a doubt, that this department of the animal kingdom attracted the attention of mankind in the remotest ages: several birds, as you are aware, are indicated by name and their peculiarities alluded to in Holy Writ. Mention is frequently made in the earliest and best of books, the Bible, of the soaring eagle, the dismal raven, the tiny sparrow, the grave-looking owl, the migratory stork. The care taken of the prophet Elijah by our sable and far-seeing friend the raven, you all remember reading of. This reminds me I am indebted to my friend, Colonel Rhodes—the Sillery *Nimrod*—for this splendid specimen of the raven, shot last winter whilst cariboo-hunting at St. Paul's Bay.

The dove and raven were both honoured with important missions by that distinguished and most successful navigator Noah. You know how much the ibis was petted, nay honoured, in Egypt: the white ibis was in special veneration in Thebes—had the run of the city. The stork was sung by Herodotus, the swan by Virgil and a host of other poets: Aristophanes, some twenty-three hundred years ago, celebrated not only the croaking of frogs, but also the melody of birds.

It was, however, reserved to one of the loftiest minds of antiquity, Aristotle of Stagyra, to furnish the world with the earliest methodical information on zoology. This great man was the first to observe and attempt to explain the organization of animated nature. His treatise, *Nepidwon Icroptac*, will ever be regarded as one of the masterpieces of antiquity. The generation of animals, their habits, their organs, the mechanism of their functions, their resemblances and differences are therein discussed with astonishing clearness and sagacity. Aristotle may be reckoned as having established a solid basis for Natural History; and his principal divisions of the animal kingdom

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are so well founded, that almost all of them are still substantially admitted. In arranging facts, he carefully goes back to causes from general results.

We next come to the Roman, Pliny the Elder, born A.D. 23, who died, as you may have read, in the year 79 of our era, from the noxious fumes of Vesuvius during the eruption which, it is said, destroyed Herculaneum. Having the charge of a Roman fleet, he had, in attempting to succour some of the unfortunate inhabitants, ventured too near the scene of the calamity: he died during the following night. I presume some of you have perused the very interesting letter recording the event, written by Pliny the Younger, the nephew and adopted son of the Roman naturalist.

As a laborious, but not always reliable, compiler, you have heard of Aldrovandus, born about 1535. I said not always reliable: to illustrate this latter point, I shall now quote from the 1st vol. *Canadian Naturalist,* an extract purporting to describe one of our most beautiful winter visitors, the Bohemian Chatterer, or Waxwing: a specimen is in the museum of the Literary and Historical Society. I was fortunate enough to snare three very fine birds of this species in January, 1864--this is the only time I saw them round my house, at Spencer Grange. I kept them all winter in my aviary, and they soon became so bloated, so uncommonly portly, from good eating, that they were struck down by apoplexy, and one after the other died. I need not tell you the sorrow such a catastrophe brought to my family circle.

"That the Bohemian Chatterer was known to the ancients there can be little doubt; but a great deal of obscurity prevails as to the names by which it was distinguished. Some have taken it to be the *Incendiaria avis* of Pliny (book x., c. 13), the inauspicious bird, on account of which appearance Rome more than once underwent lustration, but more especially in the consulship of L. Cassius and C. Marius, when the apparition of a great owl (*Bubo*) was added to the horrors of the year. Others have suppo-

* Canadian Naturalist and Geologist, I., p. 467.

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sed that it was the bird of the Hercynian forest (book x., c. 47), whose feathers shone in the night like fire. Aldrovandus, who collected the opinions on this point, has taken some pains to show that it could be neither the one nor the other. The worthy Italian gravely assures his readers, that its feathers do not shine in the night; for he says he kept one alive for three months, and observed it at all hours (*'quâvis noctis horâ contemplatus sum'*). It is by no means improbable that this bird was the gnaphalos of Aristotle (Hist. anim., book ix., c. 16.)

"The geographical range of the Bohemian Chatterer is extensive, comprehending a great portion of the arctic world. It appears generally in flocks, and a fatality was at one time believed to accompany their movements. Thus Aldrovandus observes that large flights of them appeared in February, 1530, when Charles V. was crowned at Bologna; and again in 1551, when they spread through the duchies of Medena, Piacenza, and other Italian districts, carefully avoiding that of Ferrara, which was afterwards convulsed by an earthquake. In 1552, according to Gesner, they visited the banks of the Rhine, near Mentz, in such myriads that they darkened the air. In 1571, troops of them were seen flying about the north of Italy, in the month of December, when the Ferrarese earthquake, according to Aldrovandus, took place, and the rivers overflowed their banks.

"Necker, in his memoir on the birds of Geneva, observes that from the beginning of this century only two considerable flights have been seen in that Canton, one in January, 1807, and the other in 1814, when they were numerous, and, having spent the winter there, took their departure in March. In the first of those years they were scattered over a considerable part of Europe, and early in January were seen near Edinburgh. Savi observes that they are not seen in Tuscany, except in severe winters, and that the years 1806 and 1807 were remarkable for the number of them which entered Piedmont, especially the valleys of Lanzo and Suza."

I could dilate at length on the history of this mysterious stranger, who appears to have so startled antiquity. Here

is the ominous individual: see how silky his plumage! mark the wax-like tips of his wings! this is no doubt the portion which was supposed to shine at night. Be careful, however, not to confound him with the *Cedar* or *Cherry Bird*—our summer visitor: he resembles him much in plumage, but is twice his size.

Nor should we omit the names of Redi, Swammerdam, Willoughby, John Ray, and especially of Francis Bacon, amongst the laborious tillers of the soil of Natural History.

Next to Aristotle and Pliny, ranks the great botanist and naturalist Linnæus, who devoted a lifetime to reforming and rearranging the history of all natural productions, and lived to see his method triumphant and almost universally received. Nor was he a mere nomenclator; his vast genius led him to take the most elevated views of nature. He penetrated with a glance into causes which were the least obvious on the surface. Order, precision, clearness, exactitude of description and accurate knowledge of relations in detail distinguish his works. He it was who sent to America, to Quebec, the eccentric Peter Kalm: every guide-book reminds you of the amusing account Kalm wrote of Quebec and Montreal society in 1749; what a fine fellow Count de la Gallissonière, the Governor General in those days, appeared to the Swedish traveller;—how our respected grandmothers chatted, frolicked, dressed, danced;—how well he related all he saw, and some things he did not see. We are led next to consider the brilliant career of a French naturalist, an elegant writer and profound philosopher, Count Buffon. Possessed of a vast fortune, moving in the highest circles of a nation famous for its civilization and learning, Buffon, during half a century, from his *chateau* of Montbard, promulgated his canons to the scientific world: he tells us he spent forty years in his study, perfecting and rounding the sentences of his immortal works; but, when bearing in mind the life-like sketches of birds written by Buffon's successors and contradictors, the writers of the new school, such as Alexander Wilson, Audubon, Chas. Buonaparte, one is inclined to

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regret that the sedentary philosopher should have spent so much time indoors describing his favourites, instead of ransacking the forests, the fields, the seashore, to see for himself, like Audubon and Wilson, how God's creatures lived, loved, sang and died.

No doubt, my young friends, you would like to have some details of the career of the two celebrated naturalists just mentioned, especially as their fame is identified with the name of America; both, as you may know, visited Quebec. Alexander Wilson, the author of *American Ornithology*, was born in 1766, at Paisley, in Scotland. At the early age of thirteen, he was indentured as a weaver to his brother-in-law, William Duncan. His parents were peasants. A few years after we find him acting as a pedler: dealing in cambrics, cotton, calico by day; poetry and natural history by night. His restless mind, poetic temperament and poverty induced him to seek fortune in a then new and attractive arena, the United States, where he landed on the 14th July, 1794. In 1795, he again took to the pack, and next became a teacher shortly after. In 1802, he accepted a situation as tutor in a seminary near Philadelphia. There he became acquainted with Mr. William Bartram, the naturalist and botanist, who encouraged him, and lent him the works of Catesby and Edwards, on Ornithology. Space prevents me from following the ardent admirer of birds through his rural peregrinations. There is an interesting episode in his life connected with the refusal of President Jefferson to second the efforts of the aspiring naturalist. He died in 1813, aged 47, from the effect of a cold caught whilst pursuing some rare bird, having had to swim a river in order not to lose sight of it. Although progress has been made in American ornithology since the days of Alexander Wilson, his treatise, as far as it goes, serves yet as a text-book to naturalists of every nation.

How can I becomingly sketch the adventurous existence of the Prince of American naturalists, John James Audubon? Who can do justice to the memory of this noble-minded son of science, whose great work, *The Birds of*

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America, is likely to remain in succeeding ages—a permanent monument of the highest order of genius, celebrating the wonders of nature, in the denizens of the air and songsters of the grove?

John James Audubon saw daylight for the first time, in Louisiana, in 1782: he was of French extraction, and was sent to Paris to complete his studies. It was there he learned the art of drawing from the celebrated painter David. On his return to America, at the age of eighteen, he lived with his father, near Philadelphia, on a beautiful estate surrounded by park, lawns and gardens. He soon gave himself up to commercial pursuits, and, with that object in view, started for Kentucky. The whole of his books teem with the vivid descriptions of his wanderings in Yankee land. In 1810 he met, for the first time, his great rival, Alexander Wilson. In 1811, Audubon said good-bye to the *cash-book* and *ledger*, and, gun and sketch-book in hand, he dived into the depths of the American forests in quest of knowledge and materials to achieve his great undertaking. In 1814, he was favoured with an introduction to the celebrated prince of Canino, Charles Lucien Buonaparte, a close relative of the present French Emperor, and author of most valuable treatises on American Birds, some of which you will find on our shelves. After visiting the States in all directions, Audubon sailed for Paris, London and Edinburgh. His drawings of American birds had already attracted abroad considerable attention. In England he soon became acquainted with several men of note in literature: Professors Sedgwick, Whewell, Henslow, Dr. Thackeray, Dr. Buckland, Dr. Kidd; in Paris, Baron Cuvier, Swainson, Geoffroy St. Hilaire, his son Isidore;—D'Orbigny, Lesson, and other *savants* shewed him marked attention. The sovereigns of England and France patronised the enthusiastic disciple of Buffon, heading with their names the subscription list to his great work. I wish, my young friends, I could gratify your wish, and follow step by step this wonderful man in his ornithological rambles through the length and breadth of this green land: this day, you might be ascending with him one of the *bayous*

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of Florida, to watch the habits of the scarlet flamingo, and next month, scanning the prairies of Kentucky to catch the Wild Turkey on her nest; the season following might find you toiling up the rugged and barren uplands of Labrador —a locality so desolate, so rocky and inhospitable that, to use the words of the late abbé Ferland, "there is not enough of soil to bury decently the unfortunate traveller who might perchance die there". Audubon visited Quebec in 1842, residing several weeks with a Mr. Marten, in St-Peter street, an excellent taxidermist and great admirer of the feathered race, and, on his departure, Audubon requested him to accept, as a token of remembrance, a copy of his magnificent work on the Birds of this Continent. There are yet several amongst us who can recall to mind the dignified, courteous, white-haired old gentleman, with black, piercing eyes, eminently handsome in person—one of nature's true noblemen. Spencer Wood in those days belonged to the late Henry Atkinson, a warm friend of the gifted naturalist. Many the stroll did the latter enjoy at Spencer Wood, listening, under the umbrageous pines and old red oaks, to the flute-like warble of the veery and metallic notes of the Thrush. His steps occasionally wandered, I am proud to say, over that portion of the estate which has since passed to me; the shady avenue consecrated by the presence of this man of genius, is now known to my children under the name of "Audubon Avenue." These memories, which to some may appear commonplace, I recall with unfeigned pleasure; and whilst there and listening to the harbingers of spring, or poring over Audubon's works, I am reminded that here once breathed and stood the possessor of one of the most honoured names in natural science —a nobleminded fellow-man—whose glory and whose history are inseparable from that of North America. Audubon spent more than twenty years completing his superb drawings and compiling the Biography of the Birds and Animals of America; he sank to rest in 1852, aged seventy years, in the full blaze of his glory.

Next to Wilson and Audubon, in the field of Natural History, I shall point out to you a name widely respected

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in America, and well received in Europe—Professor S. F. Baird, of the Smithsonian Institute, Washington; he is known to us as the chief compiler of the celebrated 9th vol. of the Reports of this Institution, which elaborate book you have now before you; he was ably seconded in this laborious undertaking by Mr. Geo. Lawrence, of New York, and Dr. John Cassin, of Philadelphia. Dr. Cassin is also the author, amongst other publications, of a most gorgeously illustrated work on some new Western birds, also forming part of the library of this Society.

In Wilson's *Ornithology*, published in 1814, we find mentioned 284 species. Buonaparte, in 1838, has described 471. Audubon writing in 1844, brought up the list to 506. Baird's report, which appeared in 1858, enlarged the number to 738, of which more than 300 species are to be found in Canada, either as accidental visitors or sedentary species. The Smithsonian report divides the birds into six orders, viz.:—

I.	*Raptores*	Birds of Prey.
II.	*Scansores*	Climbing Birds
III.	*Insessores*	Perching "
IV.	*Rasores*	Dusting "
V.	*Grallatores*	Wading "
VI.	*Natatores*	Web-footed "

Each of these orders might comprise as follows:—I. order, 36; II. 18; III. 120; IV. 15; V. 42; VI. 69. Canada, not embracing all the varieties of climate and temperature which the American Union does, cannot be expected to unite all the varieties of birds to be found in the United States. The Canadian Fauna is nevertheless very beautiful and varied in its features, including a numerous collection of birds of prey. The web-footed order is well represented here. The Woodpecker family comprises some brilliantly habited individuals. But the most numerous and varied in plumage are the Perchers or singing birds. Alex. Wilson spoke eloquently and truly, when he said. "The ornithology of the United States exhibits a rich

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display of the most splendid colours; from the green, silky, gold-bespangled down of the minute humming bird, scarce three inches in extent, to the black coppery wings of the gloomy condor, of sixteen feet, who somestimes visits our northern regions; a numerous and powerful band of songsters, that for sweetness, variety, and melody, are surpassed by no country on earth; an everychanging scene of migration from torrid to temperate and from northern to southern regions, in quest of suitable season, food and climates, and such an amazing diversity in habit, economy, form, disposition and faculties, so uniformly hereditary in each species, and so completely adequate to their peculiar wants and convenience, as to overwhelm us with astonishment at the power, wisdom, and beneficence of the Creator.

In proportion as we become acquainted with these particulars, our visits to, and residence in the country, become more and more agreable. Formerly, on such occasions, we found ourselves in solitude, or, with respect to the feathered tribes, as it were in a strange country, where the manners, language, and face of all were either totally overlooked, or utterly unknown to us; now, we find ourselves among interesting and well-known neighbours and acquaintances, and in the notes of every songster, recognize with satisfaction the voice of an old friend and companion. A study thus tending to multiply our enjoyments at so cheap a rate, and to lead us, by such pleasing gradations, to the contemplation and worship of the Great First Cause, the Father and Preserver of all, can neither be idle nor useless, but is worthy of rational beings, and doubtless agreeable to the Deity.

The lecturer, by means of the diagram of a bird drawn on a large board then explained the different portions: *Primaries, Secondaries, Tertiaries, Scapulars, Rhump feathers, Auriculars, Tarsi, Tibia, Iris, Mirror,* total length, *alar extent,* and a variety of other technical terms.

Linnæus, in his *Systema Naturae,* divides the class of birds into six orders. Blumenbach makes *nine* orders;

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Cuvier, *six;* Vieillot, *five;* Temminck, in his *Manuel d'Ornithologie, sixteen;* Agassiz and Gould, in a recent work, recognize only *four* orders.

Classification is one of the most important portions of Ornithology. A new light has dawned on this science, since the learned researches of Dr. Thos. Brewer, of Boston, and other American and European *savants* who have applied oology to the classification of species; thus, several rare hawks, in different plumage, have been recognized by their eggs. The eggs of owls, instead of being elliptical, like those of the generality of birds, are spherical. Eggs are also identified by their markings,—lines,--spots,—stripes,—or by the absence of them, like the eggs of some of the thrushes. Collecting wild birds' eggs has become quite a trade. Scientific institutions in Europe have given as much as £15 stg. for a rare egg. Several Canadian institutions have recently added to their museums collections of birds' eggs: the Literary and Historical Society,—the Laval University, and the Normal Schools, in Quebec and Montreal. The contributions of friends in this, as in the collection of birds, have induced me to add a collection of eggs to my specimens.

Before we examine the contents of the collection laid before us, let me point out to you one particularity respecting the birds of prey: *the female in general is nearly one-third larger than the male.*

The vastness of the subject now before us is such that I am compelled to confess how rashly I acted in promising you at the outset a discourse on the ornithology of Canada. It would require, at least, a dozen of lectures to place the topic before you in a becoming manner. I shall, therefore, content myself with familiarising you with some of the specimens belonging to our museum. Let us select a few out of each order.

Here is the King of Birds—a fair specimen of the Bald Eagle. Oh! you proud, overbearing robber, on the watch at noon-day for some industrious Osprey, hurrying to his mountain home, with a lively trout in his beak; or else, says Audubon, keeping with his mate a sharp look out for

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an unsuspecting swan, a fat goose, or a dainty canvass-back. Did our shrewd, far-seeing neighbours, really intend to foreshadow the career of the Republic founded by Washington and Franklin, when they chose as their national symbol such an overbearing, grasping bully?

The Bald Eagle is more abundant in Western than in Eastern Canada. The shores of Burlington Bay and the Falls of Niagara are his favourite haunts. It is there he can be seen in his natural grandeur, circling in vast spirals over the seething caldron. The Golden Eagle, another beautiful species, is very common around Quebec. Of his ferocity, spirit of rapine, and boldness, you have heard:—of little children mysteriously disappearing from their happy homes, and of their bleached bones being found years after in an eagle's eyrie, high on the loftiest ledge of the neighbouring mountain. Science has awarded to this fine bird the cognomen of "*Aquila Canadensis*," and were it not that our future Confederacy professes to have honesty as its basis, and were it not for the sanguinary instincts of the Canadian Eagle, one would mostly wish him to take the place of the Beaver, the Rose, the Thistle, and the Shamrock, as the emblem of our nascent empire.

Shall we quit the Eagle tribe without directing your notice to that majestic Eagle which Audubon discovered whilst ascending the Mississippi in 1814, his attention having been directed to it by the pilot of the boat—a Canadian. This powerful bird, a specimen of which he shot subsequently in Kentucky, measured 43 by 122—that is, from tip to tip of wing, ten feet; and three feet seven inches from the end of the head to the extremity of the tail. But one specimen as yet exists in the American collections —that in the museum of the Natural History Society of Philadelphia. It is well to state that this gigantic bird which Audubon honored with the name of Bird of Washington, has much exercised naturalists; some protesting that is was merely an overgrown individual of the Golden Eagle, whilst others asserted that the *scutellae* on his *tarsi* denoted a distinct species.

At least twenty varieties of the Hawk family visit our

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latitudes; here is the delicately spotted Goshawk, identical with the European species: the breast is of a lovely ash colour, with most delicate markings; there is the Rough-legged Buzzard; there the Marsh Hawk, whom I am sure, on viewing this specimen, you all recognize as that unwelcome prowler who made you miss by his swoop *such* a shot, on the Chateau Richer, Crane Island, Sorel, Deschambault or Ste. Clair marshes, at some period or other of your sporting career; there is another species with large expanse of wing,—that is the Broadwinged Hawk, not so large as the Goshawk, and of plumage less bright; then comes the sharp-shinned; next, the Pigeon Hawk, and, lastly, the little Sparrow Hawk, with its elegant cinnamon-coloured back and black bands on its tail. I miss here a splendid individual, the great Duck Hawk—*Bullet*-headed Hawk, as some style him—who is none else than the celebrated Peregrine Falcon of the days of chivalry; he is tolerably common in Canada West, one was shot at Charlesbourg, near this city, some years back. The limits of my discourse prevent me from quoting, for your benefit, the elegant and truthful descriptions of the Peregrine and his fearless compeers, as sketched by Audubon. Shall we leave this fierce band of day-robbers, and investigate the doings of those formidable midnight raiders, the Owls? See how grave, how omniscient they look, with their rolling, shining yellow eyes, their soft plumage and their warm fur-leggings, impervious to cold the most intense! There he sits on his perch,—the dignified patriach of the whole tribe: the Great Cinereous Owl; look at him well—he is not an everyday visitor by any means—the largest of the owls; he even exceeds in size that white and fierce marauder, the Snowy Owl—the Great Northern Hunter, as he is aptly styled; as you know, he is frequently shot in the surrounding country during the winter months. Nature has wonderfully adapted these birds to the climates they inhabit. They hunt by day as well as by night, and, in the soft moonlight, you can scarcely hear the muffled sound of their wings, when pursuing hares or other small animals. Of the ferocity of the Snowy Owl unquestionable

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proofs exist. The attack of a Snowy Owl, rendered desperate through hunger, on a Roman Catholic Missionary, is amusingly related in a *Journal of Travel* on the Labrador coast. The Reverend Father was so astounded at the daring of the bird of prey, that he sought his safety in flight. Of the Virginian, or Great Horned Owl, there are, according to Baird, five varieties —*Atlanticus, Magellanicus, Pacificus, Articus, Virginianus: Atlanticus* and *Virginianus* alone visit Canada. This bird is often caught in the steel traps baited for foxes; the ferocious attitude and indomitable courage he exhibits, when approached by dog or man, is wonderful to behold; he snaps his powerful beak, rolls his bright eyes, and erects his feathers—the very emblem of concentrated rage. I have not heard of any successful effort to domesticate the Great Horned Owl. The Barn Owl, highly valued in some countries as a destroyer of rats and mice, does not inhabit Canada.

I have now placed before you in a row, according to their size, the Owls which visit us; you notice the gradation from the Great Cinereous, the size of a large Turkey, to the little Saw Whet, a sweetly pretty, tiny fellow, not much bigger than a Snow Bunting. What an interesting group of wiseacres they all seem? Legislative or City Councillors in conclave!

You see in the Museum of our Society some fair representatives of the web-footed Order of Birds.

First amongst them, conspicuous for the brilliancy of his plumage, note the Wood or Summer Duck, *Anas Sponsa; sponsa* means a bride, from the gay colours of the individual probably. Here is the Mallard, the Dusky Duck, the Gadwall, the American Widgeon, the Green-winged Teal, the Blue-winged Teal, the Shoveller, the Canvass-back, the Redhead, the Scaup, the Ruddy, the Pied, the Velvet, the Surf Duck, the Scooter, the Eider, the Golden-eye, the Harlequin, the Long-tailed, the Tufted, the Red-Breasted Merganser, the Hooded Merganser, and the Gooseander. What a noble-looking diver the great Loon seems, with his speckled robe of white and black? But amongst this splendid array of water-fowl, as I previously said, the handsomest is the Wood Duck, who builds in trees at

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Sorel, Lake Erie, and other places: he is, indeed, *facile princeps*. Those feathered, slim gentry mounted on stilts, you recognize as pertaining to the tribe of the Waders: the Bittern you all have seen; many of you may not have viewed before this pretty little species, called the Least Bittern; I am indebted to a Kingston friend for him. There stands next the Night Heron, or Qua Bird: have you ever observed how those two long feathers, which grow out of the back of his head, fit in one another as in a groove? You have all read, in Charlevoix and Boucher,, that two species of Crane visited Canada—the White and the Brown Crane: Linnæus and Temmink have christened one of the species *Grus Canadensis:* and still the Crane is a Western species, and ought not to visit our Arctic latitudes except when it migrates from Florida to the Arctic wilds, for the incubation of its eggs and rearing of its young. An island, once dear to sportsmen, thirty-six miles lower than Quebec, bears the name of Crane Island. You have not forgotten the mention Horace makes of the migrating Crane—*Gruem advenam*. And shall I relate to you the nice story Herodotus tells of the manner in which the death of Ibycus, the poet, was revenged by a flock of Cranes? You will then understand why the muse-loving Greeks had such a veneration for Cranes:—

"The lyric, Ibycus of Rhegium, went to dispute at the Olympic Games the prize of poetry: he came on foot, with no other companion than his lyre, on which he occasionally struck a few soul-stirring notes. At the close of his journey musing, he lost his way in the forest. Two men rushed out of the wood and struck him. The poet fell to the earth, and cast an expiring glance towards the setting sun. At that awful moment, he saw a flock of Cranes sailing past; 'Winged travellers,' said he, in an expiring breath, 'behold me!—make known the assassins of Ibycus!' The brigands laughed at these words, stripped their victim and disappeared.

"The next day, the games began at Olympia: no Ibycus appeared. The people murmured at the absence of the bard;—his rivals commenced to sing. At that moment a

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man arrived in hot haste bearing a broken lyre—all bloody and pronouncing the name of Ibycus. It was the bard's lyre, found that morning close to the corpse of the poet. A loud and deep wail was then heard in the amphitheatre: the people deplored the premature end of the young favourite of the muses; but the multitude is as easily moved to sorrow as it is to forget, and the games proceeded—the memory of Ibycus fading away. Night was closing in and would soon interrupt the amusements of the crowd, when a flock of Cranes flew over the arena; their loud notes attracted general attention: two of the crowd, in a conspicuous spot, repeated to one another, in a jocular way. 'There go the Cranes of Ibycus!' This singular remark was overheard by others: the sarcastic tone in which it was uttered, and the repulsive appearance of the utterers, all conspired to create suspicion. The murderers were arrested—questioned separately—confessed their crime, and were then and there executed; so that the avenging mission confided by the dying poet to the feathered strangers was faithfully discharged."

By long and continued efforts on behalf of some enlightened friends of agriculture, the indiscriminate slaughter of insectivorous birds in the spring and summer has been effectually stopped. You may not be hung for killing or capturing in Canada a Robin or a Tomtit, but you make yourself liable thereby to ten days of jail.

I like the old English and French custom of opening the game season by rejoicings and *eclat*. Why should not St. Hubert, the patron saint of sportsmen, have a day sacred to him in America as well as in Europe?

It is gratifying to see that if our powerful and progressive neighbours have so many things to be proud of, there is one Canadian institution which they envy us; that is, our Legislation for the protection of Fish and Game. Mr. Roosevelt (son of Judge Roosevelt), in his interesting book on the Salmon rivers of Canada, "*The Game Fish of the*

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North," testifies to that fact repeatedly. As a sop to American *amour propre*, he concludes by insinuating that it is about the only sign of progress to be found "in those benighted regions known as the British Provinces," as he humourously styles them. We will allow him, unchallenged, to enjoy his illusions on this as on other Canadian subjects, for, as a clever writer has it, "Are not illusions the best part of youth?" and Mr. Roosevelt is young. I do not think it could be possible to restore to the shores of the St. Lawrence the myriads of ducks, geese, and swans, which the old writers, such as the Jesuits, in their journal, Governor Boucher, in his *Histoire Naturelle des Oiseaux, des Animaux, et des Poissons du Canada*, written at Three Rivers in 1663—for the special information of the *Grands Seigneurs* of the Court of Louis XIV., his friends—mentioned as having seen. The account of the game met by the Jesuits on the Crane and Goose Island beaches in 1632 appears so marvellous as to be mostly beyond belief. The very beach facing this city, near the *Rifle range* at Beauport, took its name, *La Canardière*, from the legions of ducks frequenting it. It is within my recollection that a Crane Island chasseur counted he had had but poor shooting if he had bagged less than one hundred *Outardes* (Wild Geese) in a season.

You are aware that the most numerous order of birds by far is the *Passeres*. It would require a great many evenings to initiate you into their habits and history. I will consequently merely direct your attention to those now before you wearing the gaudiest uniforms: there, you will remark the brightest of Canadian birds, the Scarlet Tanager, or Summer Red Bird; how gracefully his black wings do set on the surrounding red! Hot weather alone attracts him over the Canadian border from the scented magnolia groves of Louisiana and Florida. The peasant lad, meeting him in our green woods, in ecstacy at such a display of splendour, hurries home to tell his mother that he has at last seen "*Le Roi des Oiseaux*," for such is the glorious cognomen the Summer Red Bird, during his July visits, enjoys amongst the French Canadian peasantry.

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That sprightly-looking individual with a cinnamon-coloured back and wings, a white breast and long rounded tail feathers tipped with white outwardly, is the Cuckoo; his shrill note is occasionally heard in hedges round the city. Unlike his European congener, his habits as a parent are unimpeachable; you never catch him depositing eggs in other birds' nest,—foundlings at other individuals' doors; this shabby, unnatural practice may suit his Cockney Cousin, or our Cow-pen bird; but dandy, merry Cuckoo is too excellent a gentleman, too kind-hearted a fellow, to desert his offspring. We have two Cuckoos in Canada—the Yellow-billed and the Black-billed. Next to him you notice a bird encased in a sleek, lustrous, black uniform, with gold and crimson *shoulder-straps*, a veritable rifleman amongst the feathered tribe; that is the Red-winged Starling: is he not a jaunty, military-looking son of song? sporting *epaulettes*, he ought to stand well with the ladies; doubtless his name of *Field Officer* is due to their admiration of his gaudy uniform. There sits Robin Redbreast. What nice anecdotes I could tell you about him, my familiar friend, who returns each spring to nestle in a bushy evergreen under my library window, notwithstanding several murderous raids made in the vicinity, in the dead of night, by some marauding grimalkin, when, unfortunately for my feathered neighbour, the trusty guardian of the grounds, my mastiff *Wolf*, is wrapped in balmy sleep. You can understand what a lively memory birds retain of the spots in which protection has been extended to them, when I tell you that for six years past I have protected the birds building on my property, and that they have multiplied astonishingly.

There are this year upwards of forty nests of birds round me: one palm tree, next to my library window, contains the nests of no less than two pairs of Chipping Buntings, that friendly little fellow who comes in the very house-steps to pick up crumbs. Close to it stands a small soft maple tree: a pair of Black-cap Titmice have been industriously scooping a hole out of the heart of the tree for a week. From the habits of this bird, which, I presume,

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is better known to you under the name of *Chickadee,* none do I prefer to see building about my garden: the quantity of insects it destroys in catering for its young is really prodigious. About two acres from this spot, another family of Chickadees seem intent on applying for a location ticket. Wilson's Snow Bird breeds amongst the grass, and is as careful about hiding the cradle of his children as the Song Sparrow. Robins' nests and Yellow Birds' nests are in course of construction all over the premises: the angle of a structure used last winter as a snow-slide, has been taken possession of by a pair of Robins.

Allow me to introduce to you a brave, indomitable bird —the King Bird *(*Tyrant fly-catcher*)*; the peasantry call him *Tri-tri,* from his rapid, querulous note; schoolboys know him as the Crow-beater: observe the little orange tuft of feathers in the centre of his top-knot. Next to him you notice a bird with a beak notched like a Falcon: take my word for it, that is a sanguinary villain. Naturalists call him "The Shrike,," or Butcher Bird, from the remorseless manner in which he deals with small birds, whom he impales on thorns and tears to pieces: I wonder how he can rest at night after such enormities. Fie, fie! Mr. Shrike, you are a vile fellow!—as vile nearly as a schoolboy who *robs birds'-nests.* Do not, I pray, show your face on my premises! That grey, rough-coated bird is a Canada Jay; the lumberers and woodmen, who see him in winter rumaging round their camp, call him *Whiskey Jack:* he is addicted to pilfering; so say his enemies.

There, is a bird whom all of you recognise—the Kingfisher—Belted Kingfisher, on account of the rust-coloured badge encircling his throat and breast. To heathen mythology he is known as *Alcedo Alcyone.* Alcyone was the daughter of Eolus: being a perfect model of conjugal fidelity, she was rewarded, at her death, by being metamorphosed into a bird, and the heathen god, her father, whom I shrewdly suspect to have been in league with the clerk of the weather, arranged matters so that in midsummer, a succession of so many calms took place that our expert

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fish-catcher could build her nest on the heaving bosom of the ocean, and rear her young undisturbed. This was, to say the least, a great privilege. Hence the origin of halcyon days—days of peace and prolonged security. I can guarantee this fact, *on the faith of heathen mythology!*

One of the most musical groups amongst our native birds are the Thrushes: some six or seven varieties are now displayed before you. First, the Robin, or Migratory Thrush; next, the Catbird, an excellent mimic, whom you can easily distinguish from his congeners by his ash colour; then, that beautiful variety, the Golden-crowned Thrush; the Hermit Thrush, which is attracted to the cool shades of damp woods, where he can, undisturbed, go and bathe at sunrise and sunset in some secluded, purling, limpid stream,—how oft have I watched him! One of the sweetest song birds of Western Canada is the Brown Thrush, or Thrasher: here is a good specimen—you will notice how much longer his tail is than that of the Hermit Thrush or Golden-crowned Thrush. The Wood Thrush is not very common in Lower Canada; and I am inclined to believe the sweet songster who, amongst the Canadian peasantry, is known as "La Flute"—the flute—from its metallic notes resembling the double-tonguing of the german flute, is Wilson's Thrush. The Thrush family in Canada open for young naturalists a wide field of enquiry.

That little group of long-winged individuals, you of course recognise as the Swallows, of which five species visit Canada. The first, supposed to be the real harbinger of spring and hot weather, circles over our heads, at Quebec, for the first time each year, about the 23rd of April. The Black Chimney Swallow, or Swift, who dives perpendicularly down our chimneys to build its nest, forms part and parcel of every Canadian rural home: as we never see him build elsewhere than in chimneys, the question arises, where did he build before the invention of chimneys? You can add that to the other hard problems with which your painstaking teachers try your ingenuity. This is the Pur-

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ple Martin—a larger species: each day, when I pass down the Upper Town market-place, and notice the garrulous crowd of Martens twittering round the eaves of the old Jesuit Barracks, I ask myself whether they are all the grand-children of those Purple Martens whose ancestors, Alexander Wilson saw, in the beginning of this century, "in great numbers, at Quebec;"* for the memory of locality is great in Swallows as well as in other birds.

That broad-mouthed, long-winged, short-legged, dark bird, squatting on the ground, with white badges on its wings, is the Night Hawk, or Goat Sucker, *Caprimulgus*. You, no doubt, are aware why he is so persistently called

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* Another man of note, just dead, visited Quebec about 1824, the eccentric naturalist, Charles Waterton, the discoverer of the *Wourali poison*, and author of several works most amusingly and instructively writen. Charles Waterton humorously said that the principal blessings the House of Hanover had conferred on the English people were the suppression of Popery, the creation of the ing tremendous fortifications at Quebec. It will be the Gibraltar rat. Do not be surprised if the passage of his book, relating to Quebec, should contain something eccentric also:—"They are making tremendous fortifications at Quebec. It will be the Gilbraltar of the new world. When one considers its distance from Europe, and takes a view of its powerful and enterprising neghbour, Virgil's remark at once rushes into the mind,—

"Sic vos non vobis nidificatis aves."

"I left Montreal with regret. I had the good fortune to be introduced to the Professors of the College. These fathers are a very learned and worthy set of gentlemen; and on my taking leave of them I felt a heaviness at heart, in reflecting that I had no more time to cultivate their acquaintance. In all the way from Buffalo to Quebec, I only met with one bug; and I cannot even swear that it belonged to the United States. In going down the St. Lawrence, in the steam-boat, I felt something crossing over my neck; and on laying hold of it with my finger and thumb, it turned out to be a little half-grown, ill-conditioned bug. Now, whether it were going from the American to the Canadian side, or from the Canada to the American, and had taken the advantage of my shoulders to ferry itself across, I could not tell. Be this as it may, I thought of my Uncle Toby and the fly; and so, in lieu of placing it upon the deck, and then putting my thumb-nail vertically upon it, I quietly chucked it amongst some baggage that was close by, and recommended it to get ashore by the first opportunity."—*Waterton's Wanderings*, p 223.

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Goat sucker by naturalists; it is because he never in his life sucked a Goat—never dreamed of it. It is one of those outrageous fabrications invented, by ignorance, to filch a poor bird of his good name, and which *took root* only because it was oft repeated. In the days of Olaüs Magnus, Bishop of Upsal, in Sweden, few dared to doubt but that Swallows, instead of going to Senegal and the Gold coast to spend their Christmas and Easter holidays, dived before winter into the bosom of Lakes, and hybernated under the ice till spring, with no gayer companions than a few meditative trout or other fish. This was another absurd theory, but which had many great names to support and prop it up. The Revd. Gilbert White, in his *History of Selborne*, a nicer book than which you could not read, eloquently demonstrated how absurd, how impossible such a thing could take place.

You recognize at one glance that little fairy—dipped in a sunbeam, begemmed with opals, rubys, and living sapphires—it is the Ruby-throated Humming Bird. One species only frequents our climes, though it constitutes a numerous family in South America and in the West Indies. How oft in the dewy morn have you not noticed the little sylph, ecstatic with delight, hovering over the honeysuckle and bright geranium blossoms, and inserting in their expanded corollas his forked tongue in search of insects and honey. Need I dwell at length on all his loveliness, his incomparable beauty, when you can refer to the glowing descriptions which two great masters, Audubon and Buffon, have left—Audubon's especially. In spite of his elegance of dicton, the sedentary philosoper, Buffon, must yield the palm to the naturalist who studied God's creatures on the mountains, prairies, sea shores, plains, fields and forests of our continent.

I now hold in my hand a most gorgeously-habited little songster, who pays us an occasional visit in July. His azure mantle has bestowed on him the name of *Indigo* Bird. Buffon calls him "Le Ministre," probably because he was, like the French Ministers of State, robed in blue:

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our own Cabinet Ministers, as you know, on the recent visit of the Prince of Wales, chose blue for their *grande tenue officielle*. Never shall I forget one bright July morning walking in my garden, shortly after sunrise. In the centre there stood an old apple tree, bearing pink and white buds and green leaves; close to it my children had grown a very large sunflower: its corolla was then lovingly expanding to the orb of day, whose rays streamed through the overhanging canopy of dew-spangled blossoms. In the fork of the apple tree a pair of Robins had built their clay-cemented nest, in which, protected by soft hay, rested four emeralds of pure sea-green, whilst the male Robin was carolling forth his morning hymn from the topmost branch of a neighbouring red oak. I was in the act of peering in the nest, when my eye was arrested by the resplendent colours of an azure bird nestling in the sunshine on the saffron leaves of the sunflower. The brightness of the spectacle before me was such, its contrasts so striking, that I paused in mute astonishment at so much splendour. Was it a realm of dream-land spread out before me—a vision painted by a fairy! It was, my young friends, only the Indigo Bird of Canada, in his full nuptial plumage, seen amidst the bright but every-day spectacle of a Canadian landscape.

What a charming musician, the Vireo or Red-eyed Fly Catcher, during his protracted stay from May to September: scarcely visible to the naked eye, amidst the green boughs of a lofty elm, he warbles forth his love ditty from sunrise to sunset? How eagerly I watched, this spring, for the return from the South of the *Sweet, Sweet Canada bird*, the white-throated Sparrow—whose clear, shrill clarion resounds even in the depth of night! How is it he did not accompany this spring his congener, the Song Sparrow—the *Rossignol*—so dear to every Canadian h[illegible] with its simple but soft melody?

Have any of you ever noticed the Redstart dartin[illegible] an arrow, after the small flies, then relighting on th[illegible] uttering his shrill *increasing* note, very similar to t[illegible] that pretty summer Yellow bird, also one of the fly-

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ers, as you are aware,—a family most numerous, and if not generally gifted with song, at least wearing a very bright livery. The Redstart, the male bird, is easily known by his black plumage; when he is flying, he discloses the under portions of his wings, which appear of bright maize. The female is more of an olive hue, and does not resemble at all her mate: they breed all round Quebec, and stop here about three months. It is needless for me to furnish you with a very lengthy description of the Blue Jay: you are all acquainted with his cerulean plumage and harsh note, especially before rain.

I must not, however, forget to point out to you that richly-dressed individual, wearing black and orange badges: that is the Baltimore Oriode. He visits chiefly the Montreal district and Western Canada. Black and orange, did I say? why that was the official livery of a great English landowner of Maryland, in the days when democracy amongst our neighbours was not. We have it on the authority of Alexander Wilson, no mean authority, as you know, that this brillant July visitor took its name from Lord Baltimore, on whose estates a great number of Orioles were to be seen. It is satisfactory to find that, even in Republican America, the English aristocracy is becomingly represented not only at the White House, but also in the green fields and green woods of the great Republic. The *Baltimore Oriole* is a tolerably good musician. You can see how brilliant are the colours of these Canada birds now exhibited to you!

I think you will all agree with me, in saying that no country can furnish a group of brighter ones than those now exposed to view, and composed of Canadian birds only:—the Golden-winged Woodpecker, or Rain Fowl; Blue Jay; Field Officer; Maryland Yellow Throat; Wax Wing; Indigo Bird; Ruby-Throated Humming Bird; Scarlet Tanager; Baltimore Oriole; Meadow Lark; Pine Gros Beak; Cardinal Grosbeak; Rose-breasted and Towhe Bunting.

As for song, we may safely assert, with the same Alex-

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ander Wilson,* that the *Fauna* of America can compete with that of Europe: true, we have not the Skylark, nor the Blackbird; and the Robin, although very similar to him in note and habits, is still his inferior; but we have the Wood Thrush, with its double-tongued flute notes, Wilson's Thrush, the Brown Thrush, the jingling, roystering Bobolink, the Canadian Goldfinch, whose warble reminds you of the Canary. The far-famed European Nightingale has certainly met with a worthy rival in the American Mocking Bird, whose extraordinary musical powers have been so graphically delineated by the great Aububon.

My young friends,—I was thinking of introducing you into the very *sanctum* of Natural History, and the advanced hour of the evening compels me to leave you merely at the threshold. If it should so please you, we may, at some future day, resume the investigation of this subject. I thank you for your long and constant attention.

Au revoir! J. M. LEMOINE.

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* "The opinion which so generally prevails in England, that the music of the groves and woods of America is far inferior to that of Europe, I who have a thousand times listened to both, cannot admit to be correct. We cannot, with fairness, draw a comparison between the depth of the forest in America, and the cultivated fields of England; because it is a well-known fact, that singing birds seldom visit the former in any country. But let the latter places be compared with the like situations in the United States, and the superiority of song, I am perfectly persuaded, would justly belong to the Western continent. The few of our song birds that have visited Europe extort admiration from the best judges. 'The notes of the cardinal grosbeak,' says Latham, 'are almost equal to those of the nightingale.' Yet these notes, clear and excellent as they are, are far inferior to those of the wood thrush; and even to those of the brown thrush, or thrasher. Our inimitable mocking bird is also acknowledged, by themselves, to be fully equal to the song of the nightingale in its whole compass. Yet these are not one tenth of the number of our singing birds. Could these people be transported to the borders of our woods and settlements, in the month of May, about half an hour before sunrise, such a ravishing concert would greet their ear as they have no conception of."—*American Ornithology*, vol. II., p. 275.

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PAPER VIII.—ON THE MEASUREMENT OF HEADS IN ETHNOLOGICAL INVESTIGATIONS.

BY JOHN LANGTON, ESQ., M.A.

THE subject of the present paper was brought before the Society, in a verbal communication, about a year ago; but I think it may be of sufficient importance to those who are engaged in ethnological investigations, based upon the forms of skulls, to place it in a more formal shape before you.

That the different races of mankind are distinguished by peculiar forms of skull, speaking generally, and with a large allowance for individual varieties, has long been admitted; and some comprehensive terms of classification have been adopted--as brachycephalic, dolichocephalic and cymbocephalic—which mark with sufficient accuracy the most conspicious variations of type which present themselves. But no man can have examined a considerable collection of skulls of the same race, without being struck with the great varieties of shape exhibited by different individuals; and though the prevailing type may be brachycephalic or dolichocephalic, yet the deviations from it will be so great, in particular instances, that an ordinary observer would be apt to think that no such decided distinctions as are made by the ethnologists can be maintained. An educated eye, indeed, will still see indications which will generally enable him to classify his specimens; and the averages of a large number of measurements will shew a tendency to conform to a particular type. But even the professed ethnologists, when generalizing from a large number of specimens, and with the aid of accurate measurements, have arrived at singularly diverse opinions as to what the characteristics of any particular race are, and as to what races have a common organization. Morton recognizes one uniform type of American skull, from the Arctic Ocean to Cape Horn, which, according to him, differs in essential particulars from those of the inhabitants of the

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old world; whilst others, who have all his specimens to appeal to, and the larger experience of subsequent collections, trace as many varieties of structure in American skulls as can be found in the crania of Europe and Asia. An impartial observer, therefore, not committed to any theory, or the inventor of any imposing terms of classification, will be apt to consider the whole subject too much in its infancy to be pronounced upon with any approach to dognatism; and though he may admit that there may be a classification of which the subject is susceptible, he may be excused if he doubts whether we have as yet hit upon the proper method of establishing it.

I make no pretensions to be an authority upon ethnology; but, having been thrown in the way of persons devoted to the study, and having read a good deal upon the subject and examined many skulls, especially of our aboriginal tribes, I confess that this was about the conclusion I had come to, when the circumstance occured which gave rise to the investigation which forms the subject of the present paper. You will recollect that my friend Dr, Daniel Wilson, of Toronto, the author of Prehistoric Man, and a great authority upon skulls, was asked, in passing through Quebec on his road to England, to deliver a lecture at a Conversazione with which we concluded the Session of 1863. The subject which he selected was "Artificial cranial distortions as illustrative of Ethnology." A few days before he arrived, my friend, the Rev. James Douglas, going to be measured for a hat, was much struck with the extraordinary want of symmetry in his own head, of which he shewed me the model; and we thought that we might collect from a hatter specimens of distortions in the civilized community of Quebec, which we might exhibit in connection with Dr. Wilson's lecture upon the artificial forms of the flat heads and others. With this object, I obtained from Mr. Ashworth a very large collection of models, taken by an instrument known as the "conformàteur;" and a most wonderful array of extraordinary forms it certainly presented. The old terms of trachycephalic and dolichocephalic did not begin to distinguish the various com-

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plicated shapes which the heads of the customers of one hatter displayed. At first sight, I was struck with astonishment; but a little consideration shewed that these unnatural deviations of the heads from a common type arose, not so much from the heads themselves as from the nature of the instrument with which the models were taken. They were a gross exaggeration of the peculiarities of each head, and the principle of the instrument necessarily made them such. For those who may not have examined one, I will give a description of a conformateur.

Its general shape is that of a lowish crowned, broad-brimmed hat, the sides being composed of parallel upright rods, working into the solid brim with springs, whilst at the top of each rod is another rod at right angles to it, all of which converge towards a centre and together form the top of the hat. These latter rods, which form the top, are all of the same length and do not quite meet in the middle; and as the whole instrument, when at rest, forms a uniform oval, about the shape of, but rather smaller than, an average head, the ends of the rods on the top form a much smaller oval—the absolute differences between the diameters of which are the same as those of the larger one, the proportionate differences being of course much greater. On the free end of each of these top rods are sharp points, which, when the whole instrument is fitted on the head, upon pressing a spring, are driven through a piece of cardboard, and the card being cut out of the holes thus formed becomes the model I am speaking of. Thus, if the rods are each 2 inches long, upon the instrument being fitted to a head, the longitudinal diameter of which is 8 inches and the transverse diameter 6 inches, the model will have the longitudinal diameter 4 inches and the transverse one 2 inches; or, if the real diameters of the head are as 4 to 3, those in the model will be as 2 to 1; and all other differences will be exaggerated in the same way. The consequence is, that distortions, which would pass unnoticed in the natural size, become at once conspicuous in the reduced model, and strange as the shapes of the models may be,

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the hats which are made from them would attract no attention from their singularity. In making the hats the process is exactly reversed: the cards are pinned down upon another machine, and horizontal rods, of the same length as the top rods in the conformateur, are brought into contact with it, and there screwed down, solid uprights which rise from the end of them form the block upon which the hat is moulded. In illustration of this exaggeration I give here some specimens of heads which in the model are conspicuously different, but when enlarged from the same models, as they would be to form the block, their several peculiarities could hardly be distinguished except by very delicate measurements, if that would suffice.

The consequences of this exaggeration were very remarkable. I have said that I brought home a large collection of the cards (between three and four hundred in all), all of them with the names of their owners written on them, and I commenced looking over them with a view of selecting specimens of singular shape, or of marked distortion. But I had not gone far before I observed that there were two well-marked types into which they were divisible, and that in almost every case the one bore a French and the other an English name. The French head was of a roundish form, much shorter in the longitudinal diameter than the English one, but generally broader over the parietal region, from which it narrowed down often very suddenly, the breadth over the forehead being generally less than in the English head. The latter was much longer and much more even in its breadth, being sometimes almost as broad over the forehead as in the parietal diameter. Mr. Douglas and I therefore dealt the whole out into two packs, guiding ourselves altogether by the shapes, which, with some few exceptions which were put into a third pack as doubtful, was almost as easy as separating clubs from spades. Upon examining the packs, fully ninety per cent of the long heads bore English names, whilst, if I remember rightly, there was not a single exception to the short heads bearing French names. We thought, also, that we could distinguish amongst the British names a

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sub-type, as long, but narrower, and not so square, approaching in fact more to an oval, which bore Celtic names; but the difference was not very strongly marked. The only two German names which we met with were clearly distinguished from the other two types, being as short as the French heads, but of an even oval, without that sudden falling away from the great breadth over the parietal protuberances which marks the latter so strongly. Even minor differences could be detected. I had set aside five heads as well-marked, but rather exaggerated, instances of the French type, and, upon looking at the names, four of the five bore that of a well-known French family in Quebec. I took the shape of my own sister's head, which, except in size, was the exact counterpart of my own; and I fitted the conformateur on to two brothers—the Messrs. Russell—and although they do not bear a greater resemblance to each other than is common with brothers, the heads were absolutely undistinguishable, but very different from any others in the collection. In all these cases a family resemblance in the heads could be detected, much more marked than in the general features of the face.

When Dr. Wilson arrived and had delivered his lecture, I exhibited to the Society, as you will recollect, a selection of these heads, stating the facts much as I have given them upon the present occasion; and I afterwards went over the cards again with Dr. Wilson, with the same result. Since that time I have had a few opportunities of pursuing the investigation further, and I have adopted a rough method of shewing the average of a large number of heads, such as I lay upon the table this evening, viz., by tracing the outlines of each in pencil in the same space, so that whilst the inner and outer lines give the maximun and minimun size, the broad dark line, where the pencil has frequently gone over the same ground, indicates a rude average form of the two types of English and French.

Dr. Wilson subsequently pursued the subject further, and gave the results, amongst much interesting matter, in

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a paper "On the physical characteristics of the ancient and modern Celt," read before the Canadian Institute, and published in the Canadian Journal of November, 1864. He has examined, in all, upwards of eleven hundred heads, from which he thinks that he has established a recognizable distinction between the pure Anglo-Saxon, as indicated by his name, and the Celt of either Ireland, Scotland or Wales. The former he considers to be marked by an almost uniform width; whilst the latter is much the widest over the parietal protuberances, and tapers away towards the frontal regions, giving it a sort of pear shape. He states that only two out of upwards of four hundred which he had classed as of the former type bore other than pure English names; but there appear to have been a considerable number of English in the class representing the Celtic division. To a certain extent, this conclusion of Dr. Wilson's accords with the indications of a difference between the forms of heads bearing Saxon and Celtic names, which Mr. Douglas and I thought we had perceived at Quebec; but neither then, nor in some subsequent examinations of the same kind, did I meet with any such decided uniformity in the result as Dr. Wilson appears to have found in his specimens. Moreover, I should hardly have called the Celtic head "pear shaped," but rather tending to oval, the absence of squareness being its main distinction from the Saxon head. There is another point brought out by Dr. Wilson, which, if it be supported by more extensive investigation, is of considerable interest. He found that of 70 French head forms, from a Montreal hatter, classified by names, only eleven presented the peculiar form so conspicuous at Quebec. The rest were much longer, but yet not conforming either to the Anglo-Saxon or to the Celtic type. This difference, he suggests, may have arisen from the different parts of France which supplied the original settlers; and it is known that whilst those of the Quebec District came from Normandy, the Montreal District was settled principally from Brittany. The longer type of head prevalent at Montreal would, therefore, indicate the Celtic ancestry of our present population; a result,

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which harmonized exactly with the leading idea of Dr. Wilson's paper—which was to maintain the dolichocephalic type of the Celtic head, against Dr. Davies and others, who consider the trachycephalic skulls found in ancient barrows to be the true form of the head of the Celtic race.

My own subsequent investigations do not upon this branch of the subject yield exactly the same result which Dr. Wilson has arrived at. I divided a large collection of shapes, procured from Montreal hatters, according to their forms, making, as before, a third pack of doubtful cases; and then I examined the names. Many were without names or the names were illegible; but of 121 clearly bearing French names, 82 differed in no respect from the ordinary French type at Quebec, whilst 38 had been classed by me as probably British, or as doubtful; and of 152 bearing British names, 144 had been classed by me as such, and only 8 were of the short French type, or doubtful. I give in the illustration the average obtained in the rough way before indicated. If a line is drawn through the middle of the dark space, where the pencil has frequently gone over the same ground, it gives an average form for the 83 Montreal French heads which cannot be distinguished from the average Quebec type; but the 38 exceptional French heads have all the characteristics of the British type. There does, therefore, appear to be a difference between the French at Montreal and at Quebec, but by no means to the same extent that Dr. Wilson found in his specimens.

The mere fact that there should still be an unsettled dispute as to the distinctive type of the Celtic skull, when we have so many opportunities of examining the point both in living subjects and in ancient remains in so many different localities, and with various amounts of intermixture in the race, is of itself sufficient to prove that the science of the craniologist has not as yet attained to that certainty in its results whic[illegible]itle it to any very great degree of confidenc[illegible], that we have not as yet followed the best n[illegible]ing and recording the differences which [illegible]st bet[illegible] different

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races, as well as between different individuals of the same race? And may not a modification of the principle of the conformateur enable us to judge better of those differences, and to present them in a tangible shape for comparison with the observations of others? It is because I believe this to be the case, that I bring the subject under your notice this evening.

Let us consider what the methods now in use are. Certain measurements are taken with callipers, or with a tape, some of which cannot be obtained in the living subject. They generally are—the longitudinal diameter, the parietal diameter, the frontal diameter, and the vertical diameter. Then there are the intermastero arch and the occipito-frontal arch, and finally the horizontal circumference. Taken together, these undoutedly give us many important data, and when accompanied with a verbal description of remarkable peculiarities, as a flattened occiput, a receding forehead, &c., and, in selected instances, with a drawing of a skull from various points of view, they form the stock-in-trade of the craniologist; but are the data precise enough to found any large induction on? I exclude altogether from consideration the drawings of particular skulls. They can only be given in rare instances—cases, in fact, selected for some noticeable peculiarity, or presented as the type of a particular class. But the object of such an investigation is to arrive at such an average type from the examination of many skulls, not to accept of the conclusions of another, which may be biassed, as we know often happens, by a preconceived theory, like Dr. Morton's uniform American form of head. Descriptions also of individual specimens, besides their necessary vagueness, must be confined to a few cases, and, without some aid from description, the measurements themselves convey no very definite information. The horizontal circumference may be the same in a round as in a long and narrow head—the occipito-frontal arch does not tell us whether there is a receding forehead or a sloping occiput, or whether the crown of the head is flat or arched. The diameters are certainly more precise in the information they

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yield, for those points at least at which they are taken, but many important particulars escape notice altogether; and it would be quite possible to find, or to model, two skulls exactly the same in all the measurements, which would yet to the eye be as unlike as any of the skulls which are selected as typical of different classes. Mere measurements in different directions, even accompanied by more or less vague descriptions, useful though they may be, can never present before us the distinctive peculiarities of any irregularly formed body. You meet a father and son, or two brothers, and you at once detect the family resemblance; but if two different observers were to describe each as minutely as you will, you would not be impressed with the same likeness, not even though they should give you certain measurements—as the distance between the outer orbits of the eyes, or from the frontal suture to the point of the chin, or the arch formed by carrying a tape round from the cheekbones under the chin. The peculiar resemblances of which the family likeness comes to, would altogether escape you, if you followed such a process; and it is a family likeness which we strive to detect in the skulls of the same race, and which mere measurements will never, in my opinion, adequately present before you. You want to have before you ALL the peculiarities of shape, in order to select those which vary in different individuals, or which are common to a large number—you want in short, if you can obtain it, a section of the skull in several different directions. Now the conformateur gives you this in one direction, with this difference only, which is not without its advantage, that all the peculiarities are exaggerated. It gives, or might be made to give, the exact measurement, not in one, but in all diameters in the one plane to which it relates; but as the absolute differences are represented on a scale much smaller than life, they are very much exaggerated, and a trifling peculiarity becomes noticeable which would not be detected by any but [illegible] precise measurement, even if this happened to be [illegible] direction. It is much upon the same pr[illegible] gineer, in giving a section of a line of [illegible]

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way or canal, makes his elevations on a much greater scale than his horizontal plan. It is not a true picture of the face of the country; but the facts are all there, if you have the key to the exaggeration, and they are conspicuous to the key to the exaggeration, and they are conspicuous to and embankments in a way that he could hardly accomplish from an array of figures alone. So it is with many other branches of science, where a series of numbers are represented graphically upon some scale, and the eye can then detect the law which they follow, in a way which it would be very difficult to accomplish by merely studying the figures themselves. It is the same with the models produced by the conformateur. The eye at once detects a certain character, a sort of family resemblance amongst a large number of models, which it would be vain to look for in discussing long columns of figures; and if an observer can do this with his own specimens, he may very readily communicate the copies (even on a smaller scale and therefore in more exaggerated proportions than those produced by our conformateur), or he may shew an average shape by the method I have adopted, copies of which may be multiplied by photography or lithography. Such an average graphically obtained would, I feel convinced, convey much more information than the names now in use, brachycephalic, dolichocephalic, kymbocephalic, scaphocephalic, platycephalic, sphenocephalic, and a host of others as learned and as vague.

The instrument must undoubtedly be modified for scientific purposes; there should be more sections than one, and we must be sure that the scale is uniform in all the instruments used, if the results obtained by different observers are to be compared. The most desirable sections, besides the horizontal one, would be the occipito-frontal one, and one from one *meatus auditorius* to the other. With such an instrument it would be difficult to retain the principle of the conformateur, which pricks out the reduced model whilst the machine is on the head. Our instrument-makers would soon devise the most convenient form; but the one which suggests itself to me would be a solid circle or oval for the horizontal section, with a

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semicircular rim fixed perpendicularly to it for the occipito-frontal section and another, sliding perpendicularly upon it, which could be moved so as to bring it in a line with the ears. In these solid rims would fit the rods, all directed to the centre of the machine, sliding in and out with springs. The fixed points, the frontal suture and occipito process for the one of the upright rims, and the orifice of the ears for the other, would not necessarily lie in the plane of the horizontal rim, so that there should be a prolongation of the two upright ones to mark those points. The machine being fitted to the head, the rods would be clamped so as to retain their position, and their ends would give the true sections of the head in the three directions. To obtain the model on the reduced scale, within each rod there might be a smaller rod, which could be driven out by a spring exactly two inches long (or any other length selected). and from the ends of those the exaggerated section could be drawn. This is only a rough idea of the kind of instrument which might be constructed, in which experience would doubtless suggest improved modifications. My object is only to advocate the principle of giving sections instead of diameters and arches, and of preventing exaggerated copies of the sections, as being much more likely to attract attention to important peculiarities.

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APPENDIX.

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REPORT OF THE COUNCIL

OF THE

Literary and Historical Society of Quebec,

FOR THE

YEAR ENDING 31st DECEMBER, 1865.

THE Council has the honor to submit the following Report of the general progress of the Society during the past year:—

The long list of members laid before the Society at its Annual Meeting, has been considerably reduced by striking from the roll all who were in arrears, and who refused to pay, and by the loss of over thirty members, who removed to Ottawa with the Government. To compensate for this, there have been added twenty-four new associate members; and sixteen were proposed, at the last stated meeting, to be balloted for to day. Our present number of associate members is 116. Two corresponding members have been elected, viz.,—Professor P. C. Sinding, and Com. Fortin; and one honorary member—the Abbé Brunet.

The stated meetings have been regularly held, and more than usually well attended. The following papers were then read before the Society:—

Jan. 18.—BY A. HARVEY, ESQ.—"On the occurrence of Gossamer in Lower Canada."

" BY J. LANGTON, ESQ.—"On the form of skulls as distinctive of different races."

Feb. 1.—BY S. STURTON, ESQ.—"On Specific and latent heat."

" 15.—BY REV. J. DOUGLAS.—"On two Egyptian mummies."

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March 15.—By H. Williams, Esq.—"On the Copper Mines of Lower Canada."

April 5.—By Prof. P. C. Sinding.—"On the ancient Scandinavians."

" 19.—By Prof. P. C. Sinding.—"On the Schleswig-Holstein question."

May 1.—By W. J. Anderson, M.D.—"On Animal Magnetism."

" 17.—By E. T. Fletcher, Esq.—"On the secular changes of the Magnetic Declination in Lower Canada, from 1790 to 1850."

" 31.—By Prof. P. C. Sinding.—"On the division of time."

Nov. 15.—By Rev. J. Douglas, Vice-President—"Opening address."

" 29.—By W. J. Anderson, M.D.—"On the coal-like substance, or altered bitumen, found in Fort No 3, at Point Levi."

Dec. 6.—By J. M. LeMoine, Esq.—"On the history of Literature." (in French.)

Papers are promised for all the remaining stated meetings of the winter. Several of them are by French members who have lately joined, and who, we ardently hope, are the precursors of many others, actuated by the same aims as ourselves, and who will be willing to cooperate with us in prosecuting them.

Another number of the Transactions has been published, forming the 3rd part of the 1st vol. (New Series) The 4th part is being published, but on a different and, the Council believes, more advantageous system than that herefore pursued. The papers appear first in the columns of the *Quebec Gazette*, and are then reproduced in pamphlet form. By that means we reduce the cost of publishing more than one-half, and give greater currency to our proceedings. The same plan has been adopted in the publication of our Historical documents, of which it is expected there will be a small volume completed before the close of the year.

The original arrangement with Morrin College expired in November, and it was then agreed that, as it was uncertain whether the College would continue to occupy the present buildings, the Society would consent to the connection being dissolved at any time, on re-

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ceiving three months' notification. The College, however, has released them for another year, and desires to retain the existing relation for that period at least. We, on our part, had no wish to sever a connection which has been productive of much benefit, and has worked so harmoniously.

The Library continues to be widely used. 873 books and periodicals are entered as having been taken out during the year. But this is far from representing the full extent of its utility; for a glance at our table, and the incomplete files of periodicals, show the extent to which the library rules are disregarded, and call for some amendment of our regulations in this matter.

The Museum is steadily growing.

The Treasurer's Report shows the state of our finances to be good.

For nearly two years there has been affiliated with this Society a branch of the Entomological Society, which has held its meeting monthly in our rooms, and stocked for the Society a cabinet of entomological specimens of great beauty and interest.

Although the Society has sustained a heavy loss in the departure of the Government, we look forward with confidence to the future. So many new members have been elected, and so hearty a determination has been shown to work vigorously and maintain its character, that we have no fears lest failure and decline succeed the prosperity of the last few years.

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REPORT OF THE LIBRARIAN

OF THE

Literary and Historical Society of Quebec,

FOR THE YEAR 1865.

THE undersigned, before surrendering his trust into the hands of the Society, begs to report as follows.—

The duties devolving on him, as custodian of the books and manuscripts of the Society during the last twelve months, have been comparatively light; the late period of the year at which the Provincial grant was received leaving little time to select new books. The addition to the books has consequently been inconsiderable.

The Librarian having thought it incumbent on him to urge the Society to devote a portion of the funds in the hands of the Treasurer to the publication of manuscripts relating to the early history of the country, the Society unanimously supported him in his efforts; and three important additions to our publications have in consequence taken place, on terms most advantageous.

The undersigned has also brought under the Society's notice the dilapidated state of several volumes, requiring new bindings or repairs to the old binding; and he is glad to state that steps have been taken, in compliance with the expressed views of the Directors, to remedy this evil. The principal Reviews and Magazines have also been bound; and steps ought to be taken to get back numbers, which may be missing.

The undersigned has made an energetic appeal to the French Canadian gentlemen, through the press, to join the Literary and Historical Society, extending hopes that the Society would devote

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still further funds to publish documents relating to the History of Canada; and he is happy to be in a position to say that the appeal has met with a responsive echo.

Amongst the attractions to the general public, frequenting the Society's rooms on lecture days, the undersigned fully believes that the procuring of a large historical Album of the celebrated Canadians and Americans, together with an Album of Canadian Scenery, would tend to enhance the interest of visitors; and that a plan could be devised by which this idea could be carried out at very little cost

The undersigned begs to call the attention of the Society to the fact, that several important documents for the History of Canada exist in the archives of Halifax, according to the statement of Dr. Anderson; and that by corresponding with the proper authorities of that city, these documents might be made available to us.

The whole respectfully submitted.

J. M. LEMOINE.

Quebec, 10th January, 1866.

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MUSEUM REPORT

OF THE

Literary and Historical Society of Quebec,

FOR THE YEAR 1865.

YOUR Curator has to report that during the past year there have been added to the Museum fifty-eight geological specimens, nineteen authenticated and rare eggs of Canadian birds, at a total cost, for specimens, stands, and stuffing the same, of $211.60

Your Curator was informed, in 1864, that Sir W. Logan would send us a collection of Canadian minerals. Not having been in office this year till the last few weeks, he has had no opportunity of enquiring respecting them; but it shall be attended to this summer.

A perfect collection of Canadian minerals is a great desideratum, and your Curator thinks that no reasonable pains or cost should be spared to secure the same.

The department of Ornithology is so far advanced, that your Curator hopes you will sustain him in completing the same as soon as possible, in order that they may be properly classified.

Your Curator respectfully thanks the various parties who from time to time have assisted him by donations.

S. STURTON,
Curator of Museum.

Quebec, January, 1866.

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DONATIONS TO THE LIBRARY

OF THE

Literary and Historical Society of Quebec,

DURING THE YEAR 1865.

A MS. document, relating to the death, burial and sword of Montgomery—from Dr. Rees.

Etat présent de l'Eglise.

The North Kingdom—from Mr. Plante.

Memoire de Montcalm—from Mr. LeMoine.

Journal and Proceedings of the Boston Natural History Society—from the Society.

Catalogue of Plants—from the Abbé Brunet.

An old letter from Lord Dalhousie to the Society—from J. Langton, Esquire, M.A.

History of Scandinavia; 1 vol. 8vo.—from Professor Sinding, the Author.

United States Diplomatic Correspondence; vols. I., II., III. and IV. —from the Consul of the U. S. A.

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DONATIONS TO THE MUSEUM

OF THE

Literary and Historical Society of Quebec,

DURING THE YEAR 1865.

Specimens of Copper Ore from Harvey Hill Mines—from Herbert Williams, Esquire.

Two Coins—from W. White, Esquire, Post-Office Department.

5-Cent United States Paper Currency—from A. Harvey, Esquire.

Canadian Fossils—from G. J. Bowles, Esquire.

Specimen of Iron Ore—from M. Miller, Esquire.

Spanish Grass, used for paper-making—from G. T. Cary, Esquire.

Twenty Stuffed Birds—from Mrs. Dixon, of Bowmanville; presented through R. S. M. Bouchette, Esquire.

A number of Fishes and Crustaceans from the Gulf—from P. Fortin, Esquire, Corresponding Member of the Society.

Lime Incrustations from the north shore of Newfoundland—from Capt. Aocah, Gaspé.

A Star Fish—from A. Holliday, Esquire.

An Opossum—from the Smithsonian Institute, Washington.

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Dr. **G. J. Bowles, Treasurer, in account with the Literary and Historical Society.** **Cr.**

1865.			**1865.**	
Jany. 1.—To Balance from last year:—			Dec. 30.—By Books, Periodicals, and Binding	$ 197 21
General Fund	$238 65		" By Specimens for Museum, and mounting same, and Cases	211 60
Historical Fund	209 17		" By Historical Documents published	20 00
		$ 447 82	" By Printing Transactions	159 55
March 1.—To Interest from Savings' Bank		9 10	" By Stationery, Advertising, &c	40 49
Sept. 27.—To Parliamentary Grant		750 00	" By Insurance	25 00
Dec. 30.—To Sale of Transactions		2 50	" By Refreshments at Meetings	49 07
" To Subscriptions received from Members		306 00	" Secretary's Salary, Gas, Postage, and other expenses	126 14
			" Commission on collecting Subscriptions	11 56
			" Balance carried to next year:—	
			Historical Fund	$189 17
			Life Members' Fund	54 65
			General Fund	427 04
				670 86
		$1515 42		$1515 42
1866.				
Jany. 1.—To Balance on hand, deposited in Quebec Provident and Savings' Bank		$ 670 68		

GEO. JNO. BOWLES,
Treasurer.

Quebec, 1st January, 1866.

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TRANSACTIONS

OF THE

Literary and Historical Society

OF QUEBEC.

SESSION OF 1866-7.

NEW SERIES.—PART 5.

Quebec:
PRINTED BY MIDDLETON & DAWSON, AT THE "GAZETTE"
GENERAL PRINTING ESTABLISHMENT.
1867.

REPRINTED: 1927 — By *La Semaine Commerciale Ltd*

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TRANSACTIONS

OF THE

Literary and Historical Society of Quebec.

SESSION OF 1866-7.

PAPER I.—ON SOLAR SPOTS.

BY COMMANDER E. D. ASHE, R. N., F. R. A. S., PRESIDENT.

(Read before the Society, 7th November, 1866.)

IN opening the Session of the Literary and Historical Society for this winter, you will allow me to congratulate you on our prosperity. Never since its foundation have we had so many members, nor were the funds ever in better condition; and I trust, by making additions to our Library annually of the most valuable books, we shall be able to offer to the Student of Literature attractions equal to that of any other Institution in Canada.

Since we last met, our land has been invaded by a "band of fierce barbarians," which was driven back by a handful of young men unaccustomed to arms; but, nevertheless, they gave a very fair sample of what Canadians would do, if called upon to defend their homes.

But the most important event of the year, is the successful laying of the Telegraph Cable between the old and new world, and the still more wonderful event of picking up the Cable of last year, that was lost in the ocean, at a depth equal to two miles; and if the "Great Eastern" never does anything else, still she has been the means of accomplishing the greatest wonder of the age.

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I may also mention that the contest between guns *versus* armour is still going on. Now, the target is unable to be penetrated by any projectile; and, again, a gun is made that goes through anything that is opposed to it. Then, Her Majesty's ship "Warrior" is covered with an armour that defies all missiles; and, lastly, the Woolwich gun is made that throws a chilled shell that penetrates and knocks to pieces the strongest armour that at present can be carried by a ship. What will follow, who can say? *Punch* remarks, that we once threw red-hot shot at our enemies, but now we throw chilled iron.

Before reading my observations on "Solar Spots," it will be requisite that I should first give a general outline of what is known on the subject, and, in so doing, I quote from the "Researches on Solar Physics," by Warren de la Rue, Esq., and gentlemen of the Kew Observatory:—

"We are first indebted to Gallileo, if not for the first "discovery of sun spots, at least for the first attempt to "ascertain through their means the period of rotation of "our luminary.

"The next great advance in solar physics is due to "Alexander Wilson, Professor of Astronomy at Glasgow, "who, in 1773, communicated a paper to the Royal Society "describing certain phenomena with regard to spots, "which in his opinion, and in that of many others, appear "to indicate that spots are cavities in a luminous photo-"sphere which surrounds the sun. The accuracy of this "conclusion has recently been questioned; but whatever "may be said regarding the theory, there can be no doubt "regarding the importance of the fact that was first "revealed by Wilson.

"The next step is due to Hofrath Schwabe, of Dessau, "who has shown, as the result of nearly forty years' labo-"rious observations, that the number of spots which break "out on the sun's surface is not the same from year to "year, but has a maximun about every ten years—a "remark which led General Sabine to observe that the "various epochs of maximum spot frequency were also "those of maximum magnetic disturbance on our own "globe.

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"Carrington is the next observer who has greatly ex-
"tended our knowledge of this subject. In a large and
"most remarkable work recently published, and contain-
"ing the result of many years' observations, he has
"shown that sun spots have a proper motion of their own,
"those near the solar equator moving faster than those
"near the Poles; and he has also interesting remarks on
"the distribution of spots in solar latitude for different
"years. In addition to these new facts, he has furnished
"us with very accurate data regarding the sun's rotation.

"We ought also to mention the discovery by Dawes, that
"what is regarded as the umbra of a spot, consists in
"many cases of two well-defined and separate parts, the
"exterior part being less luminous than the interior.

"But there is another phenomenon connected with our
"luminary, not less curious than solar spots. We allude
"to the red flames, or protuberances, which are seen to
"surround the sun's disc on the occasion of a total eclipse.

"We may be allowed to mention here that very lately
"Mr. James Nasmyth, during the course of his observa-
"tions of the sun's surface, has come to the conclusion
"that when circumstances of observation are very favour-
"able, the whole surface will be found to be composed of
"separate luminous bodies, of great similarity of figure,
"interlacing one another; and he has given the name of
"'Willow Leaves' to those appearances. The existence
"of these is still disputed: but some of our best observers
"in this country have seen them under very favourable
"atmospheric conditions, and they have been seen more
"frequently by Secchi and other Italian observers."

The questions to be answered by the "Researches on Solar Physics," are—

1. Is the umbra of a spot nearer the sun's centre than its penumbra? or, in other words, is at a lower level?

2. Is the photosphere of our luminary to be viewed as composed of heavy solid, or heavy liquid matter? or is it rather of the nature of a cloud?

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The telescope with which I made my observations has an aperture of eight inches, nine feet focal length, mounted equatorially and driven by clock-work—power used varied from 100 to 600.

I had frequently examined the surface of the sun with a small glass by Dolland, and I admit that, without reasoning on the subject, but merely from the appearance of the spots, I was wholly impressed with the received opinion—that I was looking down upon the dark body of the sun through the bright envelope that is supposed to surround our luminary. However, the moment I observed the sun with an aperture of eight inches, the appearance was completely changed, and the spots, instead of caverns, now appeared to be matter floating on its surface.

I considered that I had nothing whatever to do with accounting for how it got there, but simply to state what the opinions of eminent astronomers that have been expressed on the subject, but to make and collect observations, and, if possible, to find out any general law by which they are governed; and, after two years' close attention, I find—

1st. That, as a very general rule, the spots are first formed on that side of the sun which is farthest from the earth, and that they are first seen on the limb, and then, by the rotation of our luminary, cross his disc.

2nd. That a spot not unfrequently consists of a round, black nucleus, without penumbra. The nucleus is rarely of the same degree of blackness, some parts being much lighter than others. The penumbra forms afterwards and enlarges, and always, when viewed with a high power, appears to be broken up into detached pieces.

3rd. The nucleus divides generally into two large pieces, and very often these pieces are again subdivided.

4th. These pieces have a motion among themselves,—that is, without altering their respective shapes, they alter their relative positions to each other.

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5th. The nucleus and penumbra gradually become lighter and fade away.

6th. Sometimes the nucleus is surrounded by a border very much brighter than any portion of the sun's surface.

7th. Occasionally in the middle of the nucleus is seen a bright speck, as bright as the luminous border.

If the spots are openings in a bright envelope whose thickness we may suppose to be about one-thirtieth the diameter of the sun, then the perspective view of such an opening, when central, and at 30° and 60° from the central line, would appear as shewn in Plate 1, fig. 1.

Refraction would tend to displace the nucleus in the penumbra; but as it is only the medium that fills the cavity (and not that which surrounds the sun) that can have any effect, and as we may take it for granted that the medium that fills the cavity is of a very high temperature, I think that refraction may safely be left out in arriving at a general solution of the question, "Are spots cavities in a bright envelope?"

Admitting that these supposed openings are formed by hurricanes, causing an upward or downward rush of a medium, that breaks and forms openings in this envelope, and therefore these cavities may have any inclination to the vertical, then no matter how the openings are inclined; if it is favourable for seeing the bottom of the cavern in one position, it will be unfavourable for seeing it in another, and the view of a spot must more or less follow the rules of perspective and go through the different phases as shewn in Plate 1, fig. 1. And it would be utterly impossible to see the nucleus of a spot first on one limb of the sun, and then keep sight of it until it reaches the other limb, and in both cases not only to see the nucleus, but also to see the penumbra equal on both sides of the nucleus, if the spots were cavities.

I will now shew drawings of some spots that will illustrate some of the above remarks.

On Thursday, 12th April, 1866, a large spot was seen near the limb of the sun, as shewn in Plate 1, fig. 2, sur-

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rounded by penumbra which appeared broken up into detached pieces, and although the spot was only a few hours from the limb, yet the penumbra was about equal on both sides of the nucleus. The nucleus appeared in two separate pieces, with a little piece alongside.

Friday, 13th.—Spot appeared as shewn in fig. 3. Two islands, *a* and *b*, are of much lighter color than the larger pieces of nucleus.

Saturday, 14th.—The large spot appears as shewn in Plate 2, fig. 1; but, strange to say, the island *b* has floated outside of penumbra, leaving a clear channel through the penumbra where it has floated out.

This observation I consider most important. And a very similar occurrence was seen by R. C. Carrington, Esq.—(*See* Monthly Notices, vol. xv. page 177.)

Monday, 16th.—The penumbra appears to have cleared away between the nuclei, the upper piece is greatly reduced, and the lower piece is divided into two; but the island *b* is still intact, and the island *a* appears to have broken into two; there are three detached pieces floating away from upper part.
—(Fig. 2.)

Tuesday, 17th.—The spot has completely changed its character and a portion of nucleus has broken into pieces, and these detached pieces are distributed about.

Wednesday, 18th.—Spot slightly altered, being much smaller, and the detached pieces at the end appear as mere stains, without any appearance of closing up, but rather to have faded away.

Observations of this spot were taken until the 23rd, but as no striking peculiarity occurred, I pass on to August 8th when a spot appeared, contrary to general rule, on the side of the sun nearest the earth. The penumbra is radiated, and on one end of the nucleus appears a bright spot as if it were burning, and also one portion of the nucleus is of much lighter color than the rest. There are outlying small specs, which I have not drawn.

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Plate 1.

Central. 30°. 60°.

Fig. 1.

Fig. 1 shews the perspective appearance of a Spot, supposing them to be cavities, in a Photosphere, whose thickness is equal to 1-30 the Diameter of the Sun.

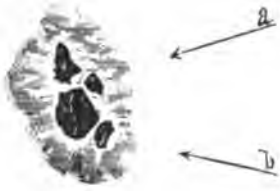

Fig. 3.

Friday, April 13, 1866.

Fig. 2.

Thursday, April 12, 1866.

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Plate 2.

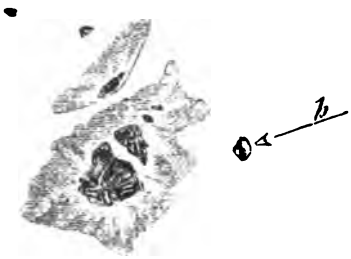

Fig. 2.

Monday, April 16, 1866.

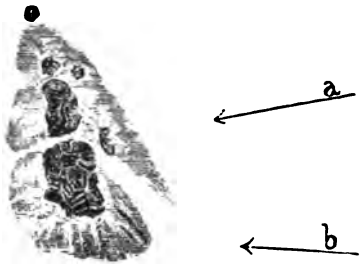

Fig. 1

Saturday, April 14, 1866.

Wednesday, April 18, 1866.

Fig. 3.

Tuesday, April 17, 1866.

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Plate. 3.

Fig. 2.

August 10, 1866.

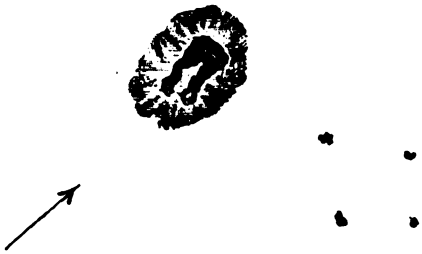

Fig. 1.

August 8, 1866.

Fig. 4.

Thursday, September 20, 1866.

Fig. 3.

August 11, 1866.

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Plate 4.

Fig. 2.

Monday, Sept. 24, 1866.

Fig. 1.

Saturday, Sept. 22, 1866.

Fig. 4.

Friday, Oct. 5, 1866.

Fig. 3.

Thursday, Oct. 4, 1866.

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riday, 10th August.—Small specs gone, and light piece ucleus has floated on to the edge of penumbra.—(Fig.

Saturday, 11th August.—The part that was on the edge penumbra is now clearly outside. There are some outing specs.—(Fig. 3.)

Thursday, Sept. 20th.--After some days of bad weather, saw this spot well on the disc.—(Plate 3, fig. 4.)—

Saturday, 22nd.—Not much changed; the triangular piece not quite detached.—(Plate 4, fig. 1.)

Monday, 24th.—The two parts have closed up. The nucleus is nearly round, with one part of the nucleus much lighter than the other. There are three small pieces of penumbra detached.—(Fig. 2.)

This spot was first seen on the 1st, and was remarkable in having its penumbra much lighter than is generally seen. On the 4th, a part of penumbra appeared to have been broken off, and there are pieces, at a short distance, that look very much like the part broken off, which appears to have floated away.—(Fig. 3.)

This spot had detached pieces which are now mere specs, and, as I have long thought, are assuming the appearance of granulations, which cover the surface of the sun. Friday, 5th.—The only change appears to consist in a bridge having formed near the middle, and the piece that floated away is not to be seen.—(Fig. 4.)

In referring again to the "Researches on Solar Physics," published by the Officers of the Kew Observatory, we read that they have carefully measured the position of the nucleus with regard to the penumbra of a spot, when in different positions of the sun's disc—three positions to the left of central line, and three positions to the right of central line—and tabulated them in columns, shewing the penumbra is in excess on the side that would shew that the nucleus is further from the surface of the sun than the penumbra; and they sum up in the following words:—"The "whole number of cases observed is 605; excluding there- "from 75, where the penumbra is equal on both sides,

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"there remain 530; of which 456 are for, and 74 against, "the assumption that spots are cavities in the sun." Now, the excluding the 75 cases where the penumbra is equal on both sides, is simply a mistake; for if 75 spots crossed the sun's disc with penumbra equal on both sides, then there were 75 cases that did not shew any appearance of a cavity and those 75 cases must be put on the other side, and the case will stand thus—for the assumption, 456; against it, 149.

But when we come to examine these 456 cases, there is not one that follows any law of perspective; and we might have expected that, out of that large number, at least one would have crossed the sun's disc, gradually assuming that appearance which, if they are cavities, we might naturally expect to see. But, as an illustration of a case, which it would be almost impossible to account for on the cavernous view of the case, I will take spot No. 361 of the Kew Catalogue, which was observed oftener than any other spot.

The amount of penumbra towards the right being equal to unity, that towards the left is equal to			The amount of penumbra towards the left being equal to unity, that towards the right is equal to		
Within 30° of left limb.	Between 30° and 60° of left limb.	Within 30° of central line.	Within 30° of central line.	Between 30° and 60° of right limb.	Within 30° of right limb.
Aug19th 20th	Aug21st 22nd	Aug23rd 24th	August 26th	August 28th	Aug29th 30th
2.0 2.0	1.3 1.2	1.1 1.1	0.9	0.9	0.6 0.8

We may suppose that the spot crossed the central line on the 25th, and penumbra should begin from that date to increase on the right of the nucleus, but instead, it gradually gets less; and although there are irregularities between the 29th and 30th, still the nucleus up to that date moves gradually in one direction.

But the observations and opinions of those who advocate the cavernous view of the case, are most unsatisfactory.—*See* Observations on Solar Spots, by Rev. F. Howlett: Monthly Notices, vol. xxii, page 7.

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My own opinion is, that the spots are formed by meteor planets falling into the sun, and after they have melted and spread out they become visible. The penumbra is the dross and the nucleus the molten mass that splits and cracks into pieces.

Let us suppose that there are innumerable small asteroids, or small meteor planets, that revolve in orbits, whose inclination to the sun's equator vary from about 27° south to 30° north, Now, as the catastrophe of falling into the sun would happen at their perihelion, this in conjunction with the sun's rotation on its axis, would produce a zone or belt, to which the spots would be confined. Then, such being the case, it naturally follows that there should be a maximum and minimum period, according to the conjunction of their periodic times.

Granting that, there is a circle of corpuscles interior to the orbit of Mercury, which, according to Mr. Le Verrier, will fully account for the perturbations of that planet, and therefore probably does exist.

I need not refer to the many well-authenticated observations of dark bodies having crossed the disc of the sun, some of which most probably were planetary bodies, as these are not the source of solar spots; but we may suppose that there are countless planetary bodies whose diameters do not exceed 120 miles,—therefore, when crossing the solar disc, they would not be visible until they had melted and expanded into a large surface. Now, it is probable that a molten mass of metal, four yards thick, floating on the surface of the sun, even at a white heat, would appear as a dark body; and a planet of 100 miles diameter would cover a space four yards thick, equal to two hundred and thirty millions of square miles—very much larger than the nuclei of ordinary spots. It is, therefore, possible for the spot to be derived from this source.

But I fancy that our sun is a nebulous star, and that the nebula consists of much smaller atoms, which are seen as the zodiacal light, and that they are falling on the sun as fast as flakes in a snow-storm, giving heat and energy to our luminary, and are seen as the granulations which

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cover the surface. And as a chicken lives on the yolk of the egg before it is hatched, so our sun may be living on its surrounding nebula until another phase in creation takes place.

The idea of the heat of the sun being kept up by matter falling into it, is ably advocated by Professor Tindal, and much strengthens the supposition.

Now, what would be the consequence and probable appearance of a small asteriod falling into the sun? At first it would not be visible; but, after it had come to the surface and spread out, it would appear as a round, black nucleus without penumbra; then, after awhile, the dross would form round the sides, and if the surface was in a great state of agitation, then we might expect that the dross or penumbra would be separated from the mass interval; it certainly might be expected that after the planet had melted into a level surface, the intense heat would split it and shew the bright surface of the sun through it; and, finally, the nucleus would fade away, leaving only dross or penumbra, which would ultimately be indistinguishable from the mottled appearance of the sun's surface.

This is the general course that a spot takes—not that any exception to the general rule would be at all fatal to the argument.

As Venus and the Earth are the principal disturbing forces, I have no doubt that the position of these bodies will be found mainly to determine the side of the sun that the spots are formed on.

In conclusion, I may say that I am preparing to enter into "Solar Photography," when I hope to give drawings of our luminary for a large portion of each year.

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PAPER II—ON CANADIAN HISTORY and BIOGRAPHY, AND PASSAGES IN THE LIVES OF A BRITISH PRINCE AND A CANADIAN SEIGNEUR.

BY DR. W. J. ANDERSON, L.R.C.S.E., VICE-PRESIDENT.

(Read before the Society, December 19th, 1866.)

In an address delivered at Fort Popham, Mr. McGee, in speaking of Canada, used the following language:—"France was ruled by a policy strictly martial to the last; and though Richelieu, Colbert, De LaGallissonière, and other supreme minds, saw in the 'New France' great commercial capabilities, the prevailing policy, especially under Louis XIV., was to make and keep Canada a military Colony." And Parkman, in his "Pioneers of France in the New World," says:—"These banded powers, pushing into the wilderness their indomitable soldiers and devoted priests, unveiled the secrets of the barbarous continent, pierced the forest, traced and mapped out the streams, planted their emblems, built their forts, and claimed all as their own. New France was all head! Under Knight, Noble, and Jesuit, the rank, lean body would not thrive. Even commerce wore the sword, decked itself with badges of nobility, aspired to forest seigniories and hosts of savage retainers. Here was a bold attempt to crush under the exaction of a grasping hierarchy, to stifle under the curbs and trappings of a feudal monarchy, a people compassed by influences of the wildest freedom—whose schools were the forest and the sea, whose trade was an armed barter with savages, and whose daily life a lesson of lawless independence. But this fierce spirit had a vent. The story of New France is from the first a story of war—for so her friends believed--with the adversary of mankind, himself; war with savage tribes, and potent forest commonwealths, and with the encroaching powers of Heresy and England. Her brave, unthinking people were stamped with the soldier's virtues and the soldier's faults; and in their leaders

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were displayed, on a grand and noble stage, the energies, aspirations and passions, which belong to hopes vast and vague, ill-restricted passions, and stations of command. The French dominion is a memory of the past, and when we wake its departed shades, they rise upon us from their graves in strange, romantic guise. Again their ghostly camp-fires seem to burn, and the fitful light is cast around on lord and vassal and black-robed priest, mingled with wild forms of savage warriors, knit in close fellowship on the same errand. A boundless vision grows upon us, an untamed continent; vast wastes of forest verdure; mountains silent in primeval sleep; river, lake and glimmering pool; wilderness oceans mingling with the sky. Such was the domain which France conquered for civilization. Plumed helmets gleamed in the shades of the forest, priestly vestments in its dens and fastnesses of ancient barbarism. Men steeped in antique learning, pale with the close breath of the cloister, here spent the noon and evening of their lives, ruled savage hordes with a mild paternal sway, and stood serene before the direst shapes of death. Men of courtly nature, heirs to the polish of a far-reaching ancestry, here with their dauntless hardihood put to shame the boldest sons of toil."

Here is the portrait and there stands the bust of the Pilot of St. Malo—the skilful and intrepid mariner, Jacques Cartier; his resolute countenance gives us "assurance of a man" bold and keen, with a spirit not apt to quail before the wrath of man or of the elements. He stands first among the Canadian immortals as the discoverer of Canada, and first in the estimation of all French Canadians. Yet, after the lapse of two centuries, the dispassionate student of history must note, that Canada first presented herself to him as a magnificent country, inhabited by a friendly, hospitable, and confiding people, who looked up to the stranger as of a superior and beneficent race; that he unjustifiably abused their confidence by the treacherous abduction of Donnacona, "The Lord of Canada," and his nine attendants. This was the great error of his life. Another, almost as fatal, was the mode of

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colonising the country, by his third expedition with Roberval. The commission set forth the objects of the enterprise viz.,—discovery, settlement, and conversion of the Indians—men without knowledge of God, or use of reason. The machinery of conversion was questionable, since he was empowered by the same commission to ransack the prisons for thieves and other malefactors, to complete his crew, and strengthen the colony.

Can we be surprised that on his arrival in Canada, four years after this outrage, with only one of those whom he had abducted, and accompanied as I have described, he found a distrustful, if not a hostile people; and that, on the failure of his high hopes, he returned to France a disappointed man—reporting "a rigorous climate, a savage people, a fatal disease, and a soil barren of gold," and carrying, as his sole trophies, a few quartz diamonds from Cap Rouge, and some sham gold from the slates of the adjoining rocks. "Thus pitifully," says Parkman, "closed the career of this noted discoverer. His discoveries had gained him a patent of nobility. He owned the seignorial mansion of Limoilou, a rude structure of stone, still standing. Here, and in the neighbouring town of St. Malo, where he also had a house, he seems to have lived for many years." Other writers, however, state, that Cartier died soon after his return, having sacrificed health and fortune in the cause of discovery. He left no descendants to inherit his name and fame; but I have heard our distinguished fellow-colonist, Mr. G. E. Cartier, say, that his family claimed descent from a brother of Jacques Cartier.

Some six years after the return of Cartier, the two Robervals and an enterprising company of young men, sailed for Canada, but they were never afterwards heard of, and they were supposed to have perished at sea. "With these two," says Charlevoix, "fell every hope of an establisment in America." In 1547 the Robervals were lost, and half a century elapsed before the next great actor appeared on the stage of Canadian history; but in 1604 Samuel de Champlain, of a noble French family, and an officer al-

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ready distinguished in the royal navy, set out on his first voyage to New France, thus commencing a connexion which continued almost without interruption for nearly thirty years; during which he conducted seven expeditions from France to the infant colony, and made many and great discoveries on this continent extending to the Far-west. In 1608 he founded Quebec, near the spot where Cartier had built his fort in 1541; and now he committed the great error of his life. To influence Indian councils, to hold the balance of power between adverse tribes, might have been a policy worthy of a statesman, and might have resulted in reciprocal benefit; but when he embroiled himself in Indian warfare, by personally taking the part of the Hurons and Algonquins against the Iroquois, he sowed the seed which produced a prolific crop of troubles to the colonists, bearing havoc and flames to unborn generations.

In 1610 he made his fourth voyage, and founded Montreal.

In 1615 he made his fifth voyage, when he was accompanied by four Recollet Fathers—the commencement of what he considered the vital principle of propagandism, to which, ever after, the military as well as the commercial character of the colony were subordinated. In 1620 he brought his family to Canada. Up to this time no child of French parents had been born in the colony; but in 1621, on the 20th of May, a son was born in Quebec, to Abraham Martin and Margaret Langlois, who was christened 'Eustache.'

In 1627 the Company of One Hundred Associates was projected by Richelieu, and approved by Champlain. This Company engaged to supply settlers with food, clothing and implements for three years and then give them sufficient land to support themselves, cleared to a certain extent; but all must be natives of France, and no strangers or heretics were to be permitted to immigrate. In 1628 Champlain had the mortification to be compelled to surrender Quebec to the Kirke expedition, and was carried a prisoner to England; the population of the city at the time being only one hundred and five. In 1633 he had the happiness to return to Canada.

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Champlain is universally acknowledged as the father of New France: he embodied her religious zeal and romantic spirit of adventure, and before the close of his career she took the posture which she held the day of her death, purged of heresy, and in the one hand the crucifix, in the other the sword. His zeal for the propagation of the faith was so great that he said—"The salvation of one soul was of more value than the conquest of an empire." In Champlain alone, says Parkman, was the life of New France! By instinct and temperament he was impelled to the adventurous toils of exploration rather than to the duller task of building colonies. The profits of trade had value in his eyes as means to these ends, and settlements were important only as bases of discovery. Two great objects eclipsed all others—to find a route to the Indies, and to bring the heathen tribes into the embraces of the Church; since, when he cared little for their bodies, his solicitude for their souls knew no bounds.

"Christmas-day, 1635, was a dark day in the annals of New France: in a chamber of the fort, breathless and cold, lay the hardy frame, which war, the wilderness and the sea had buffeted so long in vain. After two months and a half of illness, Champlain, at the age of 68, was dead. His last cares were for his colony, and the succour of its suffering families. Jesuits, officers, soldiers, traders, and the few settlers of Quebec, followed his remains to the church, LeJeune pronounced his eulogy, and the feeble community built a tomb to his honor."

A soldier from his youth, in an age of unbounded licence, when the principles of religion and morality were neither fully understood nor faithfully practised, he stood out a bright example of purity and fidelity. An enthusiastic, intrepid, persevering and successful explorer; an undaunted soldier; a pious and sincere, though bigoted, member of the Church of Rome; never thinking of self, but always of his great purpose, he was in everything truthful. "With the life of this faithful soldier." says Parkman, "closes the opening period of New France. He-

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roes of another stamp succeed; and it remains hereafter to tell the story of their devotedness, their faults, their follies, and their virtues."

Before closing this part of my subject, I must allude to the interest recently excited, by the alleged discovery of the tomb of Champlain. Should this be an actual discovery, what a lesson does it teach us of the vanity of all human greatness! In the city which he had founded and fostered, the tomb of the great discoverer and propagandist had been so neglected as to be utterly lost sight of, and the place that once knew him knew him no more; and for nearly a century stranger and heretics unwittingly have daily trampled his dust under foot. But dust to dust, and the spirit to God who gave it The earthly tomb has vanished, and its place had been blotted out of the memory of man; but Champlain has erected for himself a monument more imperishable than brass. He has left no heir of his body; but his name will live for ever,, and his fame will spread to the utmost bound of civilization.

COMMENCEMENT OF THE SECOND PERIOD.

Mr. LeMoine, in his very interesting "Maple Leaves," gives an account of the most important effort ever made by the French Crown in connexion withCanada—an effort the results of which are visible at the present day. He points out, among other things, how the names of several of the leading minds of France were associated with the fortunes of the colony, and that among the galaxy of young noblemen, who alone, in the days of privilege, could claim as a right commissions in the French regiments serving in Canada, we will find the historical names of the reign of the great monarch Louis XIV. In 1664 he sent out to Quebec the most brilliant emigration that ever sailed from France: consisting of a Viceroy, a Governor-General, an Intendant, and other necessary officers of the Civil Government; and the Regiment of Carignan, commanded by Col. DeSallières, and officered by sixty or seventy French gentlemen, most of whom were connected

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with the noblesse. The strength of the regiment exceeded one thousand; and, in addition, there was a considerable body of artizans and agriculturists, with horses and cattle;—an accession exceeding in numbers all the settlers already in the colony. Many of the officers settled in the colony, and having obtained concessions of lands, became the noblesse or seigneurs of Canada, and were the founders of the best French Canadian families of the present day. "This infusion," says Mr LeMoine, "of superior blood, education and accomplishments, operated beneficially as regards the social and domestic manners of the colonists, previously devoted to the humblest occupations of trade. Liberal tastes were encouraged, and sentiments of honor and generosity pervading the higher ranks, were felt through every class of the inhabitants."

On referring to "Titles and Documents relating to the Seigniorial Tenure," published by order of the House of Assembly in 1852, there will be found one to the Sieur De Chambly, as follows:—

"JEAN TALLON, King's Councillor of State, &c. To all, &c.

"His Majesty having at all times sought with care and the zeal suitable to his just title of the eldest son of the church, the means of making in the most unknown countries, by the propagation of the Faith and the diffusion of the Gospel, the glory of God and the Christian name, first and principal object of the establishment of the French colony in Canada, and accessorily of making known to the parts of the earth remotest from intercourse with civilized men, the greatness of his name and the power of his arms; and having judged that there were no surer means to that effect, than to compose this colony of men fit, by their personal qualities, properly to fill up, to extend by their labour and application to agriculture, and to maintain it by a vigourous defence against the insults and attacks to which it might be hereafter exposed; has sent to this country a number of his faithful subjects, officers of his troops in the regiment of Carignan, and others, most of them, agreeably to the great and pious designs of

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his Majesty, being willing to connect themselves with this country by forming therein settlements and seigniories of an extent proportionate to their means; and the Sieur de Chambly, captain in the said regiment, and commander of the troops in Canada, having petitioned us to grant him a portion of land: We, in consideration of the good, useful and praise worthy services which he has rendered to his Majesty in different places, as well in Old as in New France, since he came here by his Majesty's order."

Then follows a grant of the Seigniory of Chambly, to be held agreeably to the Coutume de Paris, "subject to the conditions that he shall continue to keep and cause to be kept house and home on his said Seigniory; and that he shall stipulate in the title deeds which he may give to his tenants, that they shall be held within one year to reside and keep house and home on the lands which he may grant or have granted to them." The grant reserves all oak timber for ship building, and all mines of gold, &c.

This grant is dated at Quebec, 29th October, 1672.

Provision was thus made for the permanent settlement of the country and cultivation of the land; but concessions were also made to the Sieur Denis Riverin and his Company, at Cap Chat and elsewhere, for the establishment of fisheries "for the catching of cod, whales, and other fish," and with the right of hunting and trading with the Indians

But the most important concessions, and what have exercised the most prominent influence on the colony, existing at the present moment in the fullest vigor, were those made to the Jesuits and other religious bodies, male and female, for the propagation of the Faith, and the education of the children of the Indians, and of Frenchmen residing in the colony. These grants were so extensive, and the land was selected with such judgment, that in Quebec and Montreal religious corporations are at this day extremely wealthy, being, in fact, in possession of the best parts of these cities, and owning the most valuable lands in their vicinity.

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In 1668 there was great scarcity of women, and several hundreds were in consequence sent from France; on whose arrival it was advertised that a supply had been sent over, and that such as had the means of supporting a wife, should have the first choice. Within a fortnight the whole lot was disposed of.

In 1720-1 Charlevoix says he found about 7,000 inhabitants in Quebec; society agreeable; the military officers and noblesse very poor, but elegant and polished. "Agriculture and commerce were little attended to." Three Rivers contained about 800; and the inhabitants of Montreal did not amount to more than one-half of Quebec.

The polity inaugurated in 1664, was maintained in comparative integrity till the conquest by the British in 1759. Its success, however, was not very marked, for during the progress of a century the population had only increased to 65,000: consisting chiefly of *censitaires* or cultivators—a frugal, industrious and moral race; and seigneurs or noblesse, who, though poor, were very much respected; and a large, equally respected, and at least as powerful, of clergy; also a considerable number of Indians, converted to the Catholic faith. With the conquest closed the *second* period of Canadian history.

COMMENCEMENT OF THIRD PERIOD.

Some time before the conquest, there came to Canada, in command of a French frigate, a cadet of a noble family in Du Pays des Basque, called DeSalaberry. He was of herculean frame, and distinguished for his bravery during all the operations immediately preceding and terminating with the conquest. He had married Mademoiselle Duchesnay de St. Dennis, daughter of the Seignior of Beauport. The issue of this mariage was a son and two daughters. After the conquest he remained in Canada, cheerfully transferring his allegiance to the new sovereign. Indeed, the terms in favor of the French colonists were so liberal, civil and religious liberty was so fully granted and so faithfully observed, that the great body of Canadians

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his Majesty, being willing to connect themselves with this country by forming therein settlements and seigniories of an extent proportionate to their means; and the Sieur de Chambly, captain in the said regiment, and commander of the troops in Canada, having petitioned us to grant him a portion of land: We, in consideration of the good, useful and praise worthy services which he has rendered to his Majesty in different places, as well in Old as in New France, since he came here by his Majesty's order."

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COMMENCEMENT [illegible]

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were well content to come under British rule, and in a short time proved themselves loyal and attached subjects.

Of the two daughters of M. DeSalaberry, one married a French gentleman, whom she accompanied to Old France; the other, after the manner of many high-born ladies, dedicated herself to God, by entering the Convent of the General Hospital in this city, where she was long known and revered as Sister St. Catherine.

The son, Louis-Ignace, at the age of seven, witnessed the battle on the heights of Abraham, from the General Hospital; went to France in 1760 to prosecute his education, and returned to Quebec in 1768 to complete it, at the Quebec Seminary. He had inherited a handsome person, tall, and strong as Hercules. His mien was dignified, and he had a most courteous and polished address. He soon became most popular with his fellow-countrymen.

In 1775, during the American war, he joined the British army as a volunteer, and served at the siege of St. Johns, where he was twice seriously wounded. DeGaspé, in his delightful "Memoires," relates that during this siege a shell was thrown into the barrack occupied by DeSalaberry and other officers, all of whom, but he, had time to escape before it exploded. After the explosion, his friends returned, fully expecting to find nothing but a mangled corpse; but, to their great surprise, they found the second Sampson, more fortunate than the first, sustaining on his broad shoulders the whole weight of the edifice! The gouts of blood which he for a long time afterwards occasionally expectorated, testified to the strain his system had undergone. In the following year he served in Captain DeRouville's Company and was wounded by a musket ball in the knee. He continued to serve to the close of the war in 1783; but he had, in February, 1778, married Mademoiselle Catherine DeHertel; and, on the conclusion of the war, he retired to his home, and, subsequently received half-pay as Lieutenant. The issue of his marriage was four sons and three daughters.

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While he was living happily in the bosom of his family, at his mansion at Beauport, in 1791, H. R. H. Prince Edward, afterwards Duke of Kent, arrived in Canada, in command of the 60th Regt., and there at once sprung up an intimacy between the Prince and Seignior only terminated by death, and which had a most important influence on the career of the young DeSalaberrys. The Prince became a frequent, almost a constant, visitor at Beauport; he became warmly attached both to M. and Madame DeSalaberry, and took a deep interest in the welfare of their children, which shewed itself in every possible way, and subsequently led to all the four sons seeking a profession in the British army.

In 1794 the Prince was transferred to Halifax, Nova Scotia; and then commenced a correspondance between him and the members of the DeSalaberry family, which was only terminated by his death. I have had the advantage of studying the whole of it, and there remains the impression that a correspondance more creditable to the heads and hearts of the parties could not have taken place. The letters addressed to the elder DeSalaberry are in French—those written to the younger are in English; but one and all, from beginning to end, exhibit, on the part of the Prince, great good sense, but warmed with a heart overflowing with generous, considerate and practical kindness, and endeavouring to anticipate every wish. Neither time, absence, change of place nor fortune, produced change in him, but he remained faithful to the last. It is my intention at a future time, and possibly in another way, to make use of these letters; in the meantime, in the course of this paper, I shall introduce such passages as are best calcuted to elucidate and to interest.

It is anticipating, but I think it better here to introduce one or two anecdotes, as told by DeGaspé:—"Without being rich," says he, "he practised a generous hospitality, and his house was open daily to such as desired to pass an agreeable evening with his amiable family, around the tea-table. He loved, and was beloved, by the young, and was amused and delighted by their society, and encoura-

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ged frequent re-unions. He was deeply impressed with religious faith, and the scene was most impressive, when, at the last sound of the bell, the father and mother, and their seven beautiful children, advanced to participate in the communion." It is pleasant, also, to read DeGaspé's account of the manner in which, in his more advanced years, he was received in passing along the streets of Quebec. He was universally saluted as one loved and esteemed; even the children had learned to revere him, and it was remarked that the dignified and venerable Seignior was as marked in returning their salutation as that of the most prominent member of the community.

His feeling of loyalty made it a point of duty to present himself at the levees of the representative of his sovereign. In 1819, when he was far advanced in life, being then in his sixty-seventh year, the Duke of Richmond was appointed Governor-General. Shortly after his arrival, he gave a soiree, at which the ladies were to be presented. DeSalaberry appeared dressed in the full costume of the Court of Louis XVI., taking his proper position before the arrival of the Governor. It thus happened that the guests, as they entered (not having as yet seen the Governor), led away by the richness of his dress, and his imposing person, mistook him for the Governor, and made profound obeisance, which he returned with all the dignity of a prince, and in good faith, not knowing there was any mistake.

In 1796 Lord Dorchester determined to raise a Canadian regiment, and called upon M. Joseph de Longueuil, M. de Salaberry, and M. Dambourges, to aid him. The Baron de Longueuil was Colonel; DeSalaberry, who had shewn great energy and had raised his company in a very short time, was appointed Major, and Dambourges was appointed Captain, of the Grenadier Company. The regiment, "*Les Voluntaires Canadiens,*" was six hundred strong, and had on its colours the device, "Try us." It served, successively, two years in Montreal, two at Sorel, and two at Quebec, when it was disbanded. The biographer of Dambourges asserts that it was frequently short of pay and supplies, and that Colonel Longueuil actually

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sustained it, for a very considerable time, out of his own revenue, and writes indignantly that, notwithstanding the sacrifices made by both officers and men, the Duke of Portland had forwarded a despatch, in 1801, to Governor Sir R. N. Milnes, containing this unjust expression: "But before I proceed further, I cannot help expressing to you my surprise that the establishment of the Canadian Battalion in Lower Canada, the principal object of which was to draw the Canadian gentlemen from their indolent and inactive habits and attach them to the King's service, should have met with no greater success."

M. L. DeSalaberry was twice elected to the Provincial Parliament, and was subsequently called to the Legislative Council. He was President of the great Committee of Quebec, and was chosen to carry the address, signed by 70,000, against the Union of the Provinces. Under the administration of Sir James Craig, he would not consent to stand a policy in support of that measure; and when threatened by him with deprivation of office, replied, "You may take from me the bread of my family, but shall never deprive me of honor!"

On the eve of the war of 1812, DeSalaberry and General DeRottenburg, by desire, wrote a joint memorial to Sir Geo. Prevost, pointing out the necessity of employing the Canadians in defence of the country; and it was that confidential communication, so favorable to the character of the Canadians, which determined Sir George to throw himself into their arms. He was subsequently named Commandant of the 1st Battalion Incorporated Militia. He enjoyed the full confidence of the men, who followed him to L'Acadie with enthusiasm; but being struck with paralysis in the right leg, he was compelled to resign the command. He lived to mourn the loss of his three younger, and to witness the triumph of his eldest son in the service of their country, having survived till 1828.

His four sons, Charles, Maurice, Louis and Edward, through the influence of the Duke of Kent, obtained commissions in the British army. Maurice and Louis, after

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a brief but honorable career, died on active service in India; while Edward, the youngest, the godson of the Duke of Kent, fell, at the head of the forlorn hope of his company, at the storming of Badajos. I shall incidentally, before the close of this paper, have occasion to advert to these again; but I will now leave them, and direct your attention to their elder and more distinguished brother, Charles Michel, the "Hero of Chateauguay." Under the auspices of the Duke of Kent, he entered the army some time in 1794, having received a commission in the Duke's own regiment, now known as the 60th Rifles; his first services were in the West Indies, where he served eleven years. He was present, under General Prescott, at the Siege of Fort Matilda, and though scarcely sixteen years of age, the General selected him, with his Grenadiers, to cover the evacuation, which he did so as to meet the marked approbation of his chief. In command of the same company of Grenadiers, he served during the Dominica campaign in 1795.

It was during his services in the West Indies, while he was stationed at Jamaica, that there occurred what may be called, not the great error, but the great misfortune, of his life. The story has been well told by DeGaspé:—"The officers of the 60th Regiment, of which Charles-Michel DeSalaberry was lieutenant, were of different nationalities, English, Prussians, Swiss, Hanoverians, and two French Canadians, Lieutenants DeSalaberry and DesRivières. It was difficult to preserve harmony among them—the Germans especially being passionate, quarrelsome, and duellists. One morning, DeSalaberry was sitting at breakfast with some of his brother officers, when one of the Germans entered, and looking at him with an insulting air, said, "I have just come from sending a French Canadian to the other world!" meaning that he had just killed Des Rivières in a duel. DeSalaberry sprang like a tiger from his seat; but instantly calming himself, said, "We will finish breakfast, and then you shall have the pleasure of finishing another French Canadian." They fought, as was then the custom, with swords; both were noted for their great skill, and the contest was long and obstinate.

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De Salaberry was very young; his antagonist more aged, and a rough bully. The young Canadian received a wound on his forehead, which time never effaced, and as it bled freely and interfered with his sight, friends attempted to stop the conflict; but he would not consent, but binding his handkerchief round his head, recommenced the fight with greater fury. At length his adversary fell mortally wounded."

How thankful ought we to be that, in our day, this barbarous practice of duelling has been discountenanced. We may not blame DeSalaberry: viewed in the light of the moral code, and the code of honor, of the time, he was in the eyes of the world, not only justified, but worthy of all commendation: for he acted under a just indignation and the generous impulse of youth; the provocation was great, and the punishment not more than adequate. We have said that this was the great misfortune of his life, and we have reason to know that he felt it so himself. Like all brave men, he never talked of his own achievements; but many years after this event, when he was happily married, and a father, his son, who had heard of his exploits, said, "Father, you were in a great many battles: were you ever wounded?" "No, my boy!" was the answer. "What, then," was the rejoinder, "is that mark on your forehead?" The father staggered as if had been shot, and getting up left the room, followed by his wife, who, on her return, explained to her son, requesting him never again to revert to the subject, as any allusion to it always gave his father great pain.

I have had before me numerous letters, written in French, by the Prince Edward, while he was in command at Halifax, to the elder DeSalaberry; they all express the deepest concern for the welfare of his family, and describe plans for their advancement. Time will not permit me to read them; but I shall give a short extract from one, dated "Kensington Palace," 9th April, 1799, immediately after his arrival in England. Having described the unpleasant passage encountered from Halifax, he says:—"On my return, I was received in the most flattering manner by

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their Majesties, and all my family. My establishment has passed both houses of Parliament and has received the Royal assent, and I have reason to know that, in a few days, I shall be created Duke of Kent. It is his Majesty's pleasure that I shall remain for the present on service in England, my head-quarters being at the centre of Hampshire, and I am to command the troops which are in camp for the defence of Portsmouth and the Isle of Wight."

It may be remarked here, that the Prince had served with distinction during the campaigns in the West Indies, having, at the capture of Guadaloupe, in 1794, led the first division in such a way "as to do the officer who commanded, and every officer and soldier under him, more honor than words can convey." Both houses of the Imperial Parliament passed him a vote of thanks "for his gallant conduct and meritorious services." Yet, though he was now 27 years of age, having been born 2nd November, 1767, and though the Duke of York had obtained his settlement at the age of 21, and the Duke of Clarence at 24, we find that the King suffered him to remain unprovided for, and in known pecuniary difficulty, till his 32nd year; and then, with marked partiality, caused at the same time an allowance to be voted to his younger brother, the Duke of Cumberland. Parliament granted him £12,000 a-year, but, strange to say, no "pecuniary assistance" to aid him in setting up an establishment, as had been the case with the Duke of Clarence. He subsequently pressed his claims on the King and Ministry, and though pledges were given, they were never fulfilled. Why? it may be asked. The only apparent answer is—his political tendencies were liberal; an offence which, in the eyes of George the Third, and his Ministry, would excuse any act of injustice. The Prince had an impression of his own, which he has recorded in a letter, in which he alludes to his carrer in the West Indies, "The wish entertained about me, in certain quarters, when serving there, was, *that I might fall!*"

However, at the time he wrote the letter quoted, and one on the 10th June, 1799, he appeared satisfied with his

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prospects. In the last letter, he says, "The reception I received on my arrival here proves the advantageous opinion which the King entertains of me. He has advanced me to the grade of General, and honored me with the post of Commander-in-Chief in British North America; and I have now to inform you that I will set out for my command in three weeks." He adds,"On account of the conflict between General Prescott and his Council, his Majesty has resolved to recall him, and appoint me his successor in his military function." He came out in the month of July; but his health gave way, and he was obliged to return to England in the autumn.

In further illustration of the undeviating interest taken by the Duke in the career of his protegés, I shall give a few more extracts from his letters:—

"Kensington Palace, 5th Feb., 1807.

"Dear DeSalaberry,—I have great pleasure in informing you that your brother Edward passed his examination at Marlow, in my presence, with credit to himself, on Tuesday, and that I left him there in charge of a very worthy man, Captain McDermott, who has promised me that he would take the same care of him as if he were his own son; so that you may write your good father and your excellent mother, that all the roughest of his labour is over, and that I trust there is now none but the most pleasant prospect before us."

On the 18th April, 1807, Maurice and Louis sailed for India, attached to the 2nd Battalion of the Royals, and on the 21st the Duke wrote announcing their departure; and the letter countains the following extract:—"As yet I do not know who will go to command the forces in Canada; but whenever I find it is decided, I will strive to get you nominated to their staff, knowing what a gratification it must be to your parents to have one of their sons so near them. But even if that should fail, I will be on the watch to avail myself of anything else that may offer for your advantage, of which, rest assured, I never will be unmindful."

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Extract from a letter, 3rd August, 1807:—

"I had the pleasure of conducting your brother Edward to Great Marlow, on Saturday last, after having spent a month at Castle-hill Lodge; and I have infinite gratification in assuring you that his conduct has been so much everything that I could wish, during the whole time, that it quite went against me to part with him; and I am sure his godmother "était au moins de moitié" in the same sentiments. Madame de St. Laurent, who knows that I am writing to you, bids me assure you of her kind remembrance, and thanks you for your recollection of her; and, as for myself, you must be sensible, I am ever, with the most friendly regard.

"Dear DeSalaberry,

"EDWARD."

In 1808 Charles-Michel, being then Brigade-Major, and stationed at Ashford, in Kent, obtained leave to visit a relative in Ireland; and it was thus his fate to fall a victim to that passion which so often turns the "young and tender wit to folly." Yet what could be more natural: the young officer was handsome and accomplished, and the lady, young, beautiful and gentle; and in every respect but fortune they were suited for each other. They loved, and wished to marry; but, before taking so grave a step, DeSalaberry thought it his duty to consult his patron and guardian. I have not seen his letter; but I subjoin the Duke's reply, which DeSalaberry has left thus endorsed: "Advice to me on the subject of marrying—paying me a very handsome compliment as a soldier." This composition is a "chef d'œuvre.

"Kensington Palace, 1st Nov., 1808.

"My Dear DeSalaberry,—Having now replied to every point contained in your letter to me, I have to advert to that you have written to Madame De St. Laurent, under date of the 30th ultimo, which she communicated to me immediately on the receipt of it last night, and will endeavour to give you my sentiments on its contents with all that candour which my friendship for your excellent parents, as well as yourself, of so many years' standing, gives you every right to expect from me.

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"From the long experience I have now had of the service of the regiments of the line, I am satisfied that no situation is so *unenviable* as that of a married officer, even when he possesses an independent fortune to enable him to support his wife and family in the style in which a gentleman (such as the profession should make every one who holds the King's commission) not only would wish, but ought to do. Of course, therefore, when the married officer has not the aid of private fortune to add to the small pittance which the regimental pay affords him, in these dear times, his situation must be deplorable, being obliged either to see his wife and family want those comforts, without which their life must be a burden to them, or to run in debt to procure them. You, my dear DeSalaberry, at this moment, possess about twenty shillings a-day pay, exclusive of those allowances which are not more than adequate to furnish and support your equipage as a staff officer. But the moment you get promotion, which naturally must be your first object, you will be reduced to fifteen shillings; for you cannot expect that, with my interest only to support you (which literally at this time is worse than none), you will be appointed to any situation on the staff, while every advancement must make you vacate the Brigade-majorship you now hold;—that being the case, I leave it to your own good sense to judge whether, upon *that* small stipend, it would either be right or honorable to table away a young woman, for whom you have a regard, from those comforts she has been used to at home, to share the wretched accommodation of, at most, two barrack-rooms, if you are so situated as to be enabled to have her with you; or, if the imperious call of duty separates you, to vegetate in some obscure lodging, on the few shillings which, I contend, you can ill spare from your scanty pay. Were I to write volumes, I could not express my sentiments more fully than I have done in the three foregoing pages: from which you will easily see that the sum of my opinion is, you *ought not* and *cannot* think of marrying your cousin; indeed, I would go further, and say, you ought to shun the very thought of matrimony,

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situated as you are; but if, under *any* circumstances, it can be right for you to think of it, it would be if chance threw in your way a woman of respectable character, who is enabled to give you, the day you marry her, that independence which there is little prospect of your being ever able to give her. After saying this, let me advise you, *de prendre sur vous*, to be explicit without loss of time, for honor, good sense, and every consideration, require it; and believe me, when you have done this, you will, to the last hour of your existence, feel grateful to me for having given you this counsel; for to be a good soldier (for which highly honorable qualification no man possesses more the requisite than yourself), it is absolutely necessary for a man to be independent, and with a wife and the prospect of a family, it is impossible for you to be so.

"As you cannot doubt my friendship, I am sure you will ascribe every word I have said to the only motive that could guide me—*that* of your welfare and future prospects. I shall not therefore attempt to apologize for the freedom with which I have spoken, but conclude here by assuring you of the warm sentiments of regard with which I ever am,

"Dear DeSalaberry, yours faithfully,

"EDWARD.

"P.S.—Madame De St.Laurent desires me to say, that I will return you your letters to your friend,Captain Levery, being convinced that you will now see the necessity of writing one of another complexion; in doing which you have my full sanction to say that you have consulted me, and to communicate the advice I have felt it my duty to give you."

In 1809 DeSalaberry accompanied his regiment on the unfortunate Walcheren expedition; and, on the 19th July, the Duke wrote him as under:—"I shall rely on your promise to write by every opportunity that offers, and that you will desire Captain Smith, who is with Brigadier General Brown, to do the same, as it is always interesting to receive accounts from two different hands, of events of the nature of those you are likely to encounter." "Madame De St Laurent and I most cordially unite in every wish success, honor, and advancement."

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From all the Duke's letters, it is evident, he anticipated nothing but disappointment from the blundering and incapacity which pervaded the management of the expedition. I shall give one or two further extracts. Under date 18th September, 1809, he writes;—"But,—exclusive of certain apprehensions which I was led to entertain (from reports which were in circulation here, of a degree of jealousy existing at your head-quarters, in regard to those officers who corresponded with me), and which made me feel backward in writing to you, for fear of its doing you disservice there,—I cannot help expressing my regret at the misapplication of the noble army that has been so uselessly employed upon a service the result of which, so far from being commensurate with the extent of the means employed upon it, could hardly be justified, even if two-thirds less force had done so little."

On the 25th September, he wrote:—"It would really seem as if those *fellows* (for I have no patience to call them anything else) were paid by the enemy to do everything against our troops, instead of being supported at a heavy expense by our own Government, to provide for their wants." "Madame De St. Laurent desires me to say how sincerely she unites with me in every wish for your welfare and happiness; and that I should inform you, for the honor of Maurice and Chevalier (Lewis), that we heard yesterday, by a letter from Mr. Hale, that these two brothers of yours had transmitted to your excellent father one hundred guineas, the result of their little savings since they had embarked for India. Such traits, she observes, ought to be engraved in indelible characters, and *so they will be in our hearts.*"

On the 10th November following, he wrote:—"There are very unpleasant rumours about a mutiny in the garrison of Flushing, among our troops, in consequence of two or three severe, though, I have no doubt, very proper examples having been made of some soldiers who were caught plundering and marauding. God grant it may not be true, and, above all, that my regiment is not among the faulty. Perhaps to-morrow you will be able to tell me

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something further about it." And:—"All now to be hoped is, either that such a change will take place in administration as will lead to the immediate adoption of the only feasible plan which in our present situation can be thought of—*that* of evacuating Walcheren, after razing or blowing up all its defences; or, that the existing Ministry will have the candour to avow the egregious error they have committed, and take that step without which we have nothing to look forward to, but the annihilation of those unfortunate corps, who are destined to encounter the pestilential sickness of that aguish climate." And:—"Nothing can be more distressing than the details you give me of the extent of the sickness, or be more bitter than the reflection, that so many poor fellows should have been so wantonly sacrificed. In the number of those who have fallen, there is none I more sincerely regret than my old, worthy friend, Major Hill, who was one of the few standards of the old stock, of which now, alas! there are but few remaining; I feel, too, much for his poor wife, whose situation, I apprehend, will be rendered most lamentable by his loss. What a scandalous shame it is, that when your commissariat had the power in their hands, as you tell me they had, of procuring you an abundant supply of fresh provisions, they should have neglected that most important point, and that, through that neglect on their part, you should now be reduced to the sad alternative, in the midst of all your sickness, of being fed six days in the week on salt provisions."

Captain De Salaberry, who had landed at the head of the Light Brigade, as aide-de-camp to General DeRottenburg, served during the whole campaign, being at the advanced posts before Flushing during the whole of the siege. After the evacuation he was transferred to Canada, and placed on the staff of General De Rottenburg. It was while he was on duty at Quebec, he received the following letter, which I must give in extenso:—

"Kensington Palace, Aug. 6, 1810.

"Dear DeSalaberry,--It was my intention on the receipt of the annexed truly afflicting letter from your brother

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Lewis, which reached me on the 9th ultimo, to have transmitted it to you, that you might be apprised of the melancholy event of which it contains the relation, and to have commissioned you to break it to your good parents and your sisters; but being unfortunately obliged, as no official report had reached the Horse Guards of your poor brother Maurice's demise, to transmit Lewis' letter to Lieutenant-Colonel Torrens, it was, through some oversight in the Military Secretary's Office, not returned to me until yesterday; so that it was out of my power to send it to you sooner. Fortunately, the departure of your friend, Dr. Keith's *protégé*, Mr. Morris, for Quebec (for whom I have obtained an Ensigncy in the 49th Infantry), affords me an opportunity of sending it, and I hope and trust it will arrive in time to prevent the account of the sad catastrophe from reaching your parents before this comes to hand, and enable you to prepare them for it.

"To you, who know how attached I am to your whole family, and how particularly partial I ever have been to poor Maurice, I need not attempt to express all I feel upon this distressing loss; but I shall depend upon you to say everything for me that is most consoling to both your parents, and your sisters, upon communicating the circumstance to them, and to assure them that were he my own brother, I could not lament his loss more sincerely than I do. I fear that it will be a very severe blow, particularly to your mother. However, she is a thoroughly religious woman, and I trust she will in time overcome it, though, I am well aware, it will be a sad task.

"No change has taken place in my situation since you left this, except a severe and most inopportune blow to my finances, which the failure of my bankers, Messrs. Devaynes & Co., has just given them—not from any actual loss, perhaps, which I have eventually to apprehend, but as leading to an unavoidable and immediaate deprivation of some of those comforts which we have hitherto always been used to; however, I have been accustomed to disappointment, and I hope I know how to meet this fresh and

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unforeseen one as I ought. Could I get out to Gibraltar, all would soon be right again, but I do not apprehend that so much good fortune is in store for me.

"Remember me to Col. Hale most particularly, and tell him that the first leisure hour I have, I will answer his letters up to the 11th of April (the last of them), which reached me on the 24th June, I shall devote to him.

"I had nearly forgotten observing to you, that now Baron De Rottenburg has attained the rank of Major-General, it will be in his power, without putting himself under an obligation to any one, to retain you with him as his aide-de-camp, which, I have no doubt, he will himself do, on being apprised of it.

"I remain ever, with the most friendly regard,

"Faithfully yours, dear DeSalaberry,

"EDWARD."

This letter requires no comment.

Some time before the declaration of war by the Americans Sir George Prevost urgently solicited DeSalaberry to raise the "Canadian Voltigeurs." The rapid levy; the equally rapid formation of this corps; their constant success against the enemy: the good example which they always set to the other young corps and the militia in general—bespeak alike their value and the service rendered in raising them.

On the advance of General Dearborn, with 10,000 men, to Odelltown, in November, 1812, Sir George Prevost sent him, with 400 men and some Indians, to dispute his entrance into L'Acadie. In this he completely succeeded, for the American general, after fruitless attempts to force him, decamped on the 23rd. November. For this service he received thanks in the following General Order, which I copy in full, to shew that at this time there was a disposition to do justice:—

"Adjutant General's Office,

"Head-quarters, La Prairie, 27th Nov., 1812.

"G. O.—His Excellency the Commander of the Forces takes this opportunity of expressing to Lieutenant-Colonel DeSalaberry, his entire approbation of his conduct in the management of the advance, as well as the high sense

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he entertains of the alacrity with which the corps of the Voltigeurs, Voyageurs, the Battalion of embodied Militia, Captain Platt's troop of light Cavalry, and the Montreal Militia, repaired to their different posts to repel the threatened invasion, and which, had it taken place, his Excellency feels confident, from the tried valour and discipline of his Majesty's regular forces, and from *the enthusiastic loyalty and courage of all classes of his Majesty's Canadian subjects,* would have terminated in the defeat and disgrace of the enemy. The extraordinary exertions which have been made on this occasion, and which thus calls forth his Excellency's notice and commendation, cannot fail from producing the most happy consequences to the future tranquillity and prosperity of the country. The General Orders of this day, and the 27th current, are to be entered into the General Orderly Books, and read at the head of every corps on parade.

(Signed,) "EDWARD BAYNES,

"Adj.-General, N. A."

In 1812 he married his cousin, Demoiselle Marianne Hertel de Rouville, a descendant of that Sieur de Rouville to whom was first granted the Seigniory of Chambly. I have given a letter of the Duke's on a former intended marriage:—

(Copy.) "Kensington Palace, 8th August, 1813.

"Dear DeSalaberry,—I have now before me your four letters of the 4th and 18th October last year, and of the 2nd of June of the present one, the former of which I received on the 28th November, and the last on the 7th instant. The first of these letters being written in all the bitterness of your anguish upon receiving that large packet of mine which contained the melancholy details of the loss of *all* your poor brothers, I shall only observe on it, that if I have so long delayed in acknowledging it, it has arisen from an unwillingness on my part to rip up those sores, which, I am aware, for a length of time can be but slightly cicatrised; and now that I resume my pen, I do it

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with some degree of pleasure, perceiving that your last letter is written in so much better spirits, although it gives but a melancholy account of your good and valuable parents.

"Madame De St.Laurent and myself, who were delighted to hear, in the first place, of the very judicious marriage you have made, have also been highly gratified in learning that she has given you a son, and not a little pleased with the compliment you have paid her by naming him after her. You will therefore judge how cordially we both unite in the fervent prayer, that the name may prove more fortunate to him than it was to your poor brother Edward.

"The accounts which you sent me of your Battalion of Voltigeurs, and the progress you make in bringing them forward in a state of discipline, prepared me for the very handsome but well-deserved compliment paid you, at a subsequent period, by the Commander of the Forces, as well as to them. It was therefore a matter of real satisfaction to me to be able to succeed in getting you the permanent rank of Lieutenant-Colonel, which, I may in truth say, you *so hardly earnt;* but I hope now all painful recollections will be done away with, and that you will continue to serve with alacrity, so long as the war lasts—looking forward to retire with honor, credit, and some advantage, at a peace; unless we can succeed in securing you, at *that* time, one of the principal staff situations in Canada. At the same time that I say this, if you could previously exchange into a permanent corps, you should not lose sight of it, as thereby establishing your right to sell out.

"To revert for a moment to the melancholy event of poor Edward's death, I most fully subscribe to the propriety of your having kept back my letter announcing it to your poor father, which, of course, will now remain in your hands, to be made use of, or not, in course of time, as circumstances may require. I grieve much to find that your father's debilitated state should have rendered his resignation of the command of his Regiment of embodied

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Militia unavoidable, as I fear that circumstances must necessarily have circumscribed his comforts. You have not mentioned, in your last letter, your good mother; I fear, therefore, you had nothing comfortable to say of her. Pray do not fail, in your next, to name her, as well as all yourselves; for Madame De St. Laurent and myself still preserve the same lively interest in their welfare, and desire to know everything about them. When I contrast the present melancholy scene of Beauport, with the recollection of what we formerly remember it, I own it depresses my spirits much, and therefore I am always ready to make every allowance for your feelings on that head.

"Should the war continue much longer, and you once attain the rank of Colonel, I trust you would obtain the clothing of your corps into your own hands; and in that case I hope you will remember Carder for your clothier, and Mr. Kirland for your agent.

"I shall long to hear from you some account of my 1st Battalion, in case you should at any time come across them; for after being separated as they were, for above eleven years, in the West Indies, I am fearful their appearance and discipline cannot be much to their credit.

"In general, all you tell me of the appearance of things in your vicinity, as to the present campaign, is extremely cheering, and I look forward with some degree of confidence to a succession of comfortable accounts from Canada during the remainder of the season. I have been doing all I can here to impress the necessity of doubling your number of seamen on the lakes, and sending you out a couple of thousand Highlanders yet this season; but I am not able to say whether my counsel will be attended to or not.

"I have recently met myself with an awkward accident, from my horse falling with me, as I was trotting briskly down the hill between the gates of Castle-hill and the bottom of Mr. Meuxe's grounds. Though it happened as far back as the 2nd of last month, I have not yet been able to leave my own premises—the cuts and bruises, though not

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dangerous, having been very
been able to keep off fever th
and I hope by the time this m
the effects of it.

"It now only remains for
Madame De St. Laurent's kin
message, to assure you of our
health, wealth and happiness
with the most friendly regar

"Dear DeS

"

"P.S.—The enclosed letter w
since for you, and he requeste
"Lieut.-Col. DeSalaberry."

It must have been observed
lost sight of an opportunity o
his friend and *protégé*, he alwa
mend that he should place hims
danger; and there DeSalaberry
We accordingly find that, befor
he had—obeying the imperious
wife and first-born son and ch
the head of his Voltigeurs.

In 1813, General Hampton
attack on Montreal with 7,000
again sent to dispute his entrance
successfully did; for the enemy,
did not care to risk a general en
but decamped to "Four Corners
positively ascertained his intenti
without orders, to countermarch
on the 1st October, with 50 Volti
surprised him in his camp, and, af
succeeded in putting him into co
reconnoissance. Dearborn and W
foiled, and the Americans having b
ler's farm, there remained only Ge

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tend with. In advancing to meet him, DeSalaberry, who had made himself acquainted with the country some weeks before, felled trees, and completely obstructed the road from Odelltown to L'Acadie, along which he had proposed to advance. Hampton made an attempt to form a junction with his Commander-in-Chief, by the route leading to Chateauguay, believing the route to be open; but DeSalaberry had been sagacious enough to know that this was the road he would probably take, completely obstructed the route, and had with great judgment thrown up field works at every strategic point. DeSalaberry then shifted his position and ascended the left bank of the Chateauguay river, to reach the other extremity of a wood, where he knew there was an excellent position in a deep swamp, permeated by rivulets. On four of these he established successive lines of defence, the last, about half a mile in the rear, commanding a ford on the right shore. Breastworks, extending into the wood, were thrown up on the lines in order to protect his right. The whole of the day was occupied in making these arrangements, and thirty men of the division of Beauharnois were sent to the front for the purpose of destroying the bridges, and still further obstructing the roads to the extent of a mile in advance of the first line. Major-General DeWatteville visited and entirely approved of the works. Sir George Prevost, with his force, was thirty miles in the rear. On the 25th October, General Hampton, with his whole army, consisting of seven thousand infantry, four hundred horse, and twelve pieces of artilery, advanced to the Canadian encampment, in which was DeSalaberry with *three hundred men*—Voltigeurs, Fencibles and Indians. Hampton, during the night, despatched Col. Purdy, with some troops, to take possession of the ford; but he lost his way. The next day (the 26th) Hampton, with three thousand five hundred men, made an advance towards the abattis, and placed Purdy at the head of one thousand five hundred more, leaving the rest in reserve. DeSalaberry, being fully prepared, advanced towards the first line of defence, leaving Lieutenant-Colonel McDonnell in charge of the second. Firing commenced effectively on the part of the

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Canadians, but ill-directed by the Americans. Purdy again attempted the ford; but, on arriving, found he had been anticipated by DeSalaberry, who threw him into disorder and repulsed him. Hampton, finding himself outgeneraled and foiled on all hands, ordered a retreat, which was not effected without considerable loss. DeSalaberry slept on the field of battle, and in the morning, at sunrise, was joined by his brother-in-law, Captain DeRouville, with his company of Voltigeurs, the Watteville Grenadiers, and a few Indians. DeSalaberry sent out Captain DuCharn, with one hundred and fifty warriors to reconnoitre, when they discovered that the Americans had abandoned their camp and retreated to Plattsburg. Wilkinson, who was at Cornwall, hearing of Hampton's defeat, retired to Salmon river, where he fortified himself.

The victory at Chateauguay prevented the junction of Hamilton and Wilkinson, arrested the invasion, saved Montreal, and enabled the British commanders in Upper Canada to resume offensive operations.

I cannot refrain from giving here a translation of a letter written by Col. DeSalaberry to his young wife, from the field of battle. It is dated Wednesday—the day after the battle—and is addressed to his father-in-law, Col. DeRouville, with an indorsement as follows:—"Recommended to the care of Major Burke, with the hope that he will forward it with as little delay as possible.—

C. M. DESALABERRY."

"My dear Maryanne,—I have to inform you that yesterday, with about 250 men, I had the honor to defeat the American army, more than 6,000 strong. I had more troops, but they were placed in position in rear. The enemy made repeated attacks on our abattis, and, after a contest of four hours, he was compelled to retire to the river at the ford, four miles from the field of battle. We have pushed our piquets in advance. This is the most extraordinary thing which has been performed since the declaration of war by the Americans.

"The Governor said to me (he arrived after the action),

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'The action which you have performed does you and your countrymen great honor, the whole of you being Canadians.' I hope he will be satisfied, though he appeared cold.

"I cannot take more than to say how much I love, or rather how I adore, you and your dear little one. Embrace him for me, and a thousand kisses for yourself.

"Ever yours,

C. M. DESALABERRY."

"We have lost six killed and sixteen or eighteen wounded —four Voltigeurs. The enemy has lost, in killed, wounded and prisoners, more than one hundred. Rouville is well, but did not arrive till after action. A thousand regards to papa and mamma."

Messrs. Morgan and LeMoine have both given accounts of the battle; and Mr. LeMoine gives extracts from the Montreal *Gazette* of 3rd November, 1813, from an account furnished by an eye-witness and participator, the late Chief-Justice O'Sullivan, who was DeSalaberry's adjutant:—"It is highly gratifying," says O'Sullivan, "that the three hundred men engaged, together with their brave commander, were all Canadians, with the exception of the gallant Capt. Ferguson, three of his company, and three officers belonging to other corps. Let this be told whenever mention is made of the battle of Chateauguay, and prejudice must hide its head, and the murmurs of malevolence be hushed in confusion."

The Hon. Juchereau Duchesnay, whose father and uncle were present at the battle, writing of DeSalaberry, says: —"It is difficult which to admire the more—his personal courage as an individual; or his skill and talents as a commander. We find him, long before the battle, displaying the greatest judgment in the choice of his position, and strengthening it, when chosen, with every means within the reach of his ingenuity. We see him, in the heat of action, embracing every object with a comprehensive view, defending every point, and providing for every contingency."

But the most gratifying testimony is that furnished by the Duke of Kent, in the following letter:—

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"Kensington Palace, 25th March, 1814.

"My dear DeSalaberry,—It was on the 22nd December that I received your letter of 28th October; and a few days afterwards, the details of your brilliant repulse of the enemy, through your worthy father, and your brother-in-law, Duchesnay.

"As in the inclosed letter for your father, which I send under flying seal in order to enable you to withdraw the postscript, or not, as you may see fit, you will see my sentiments on that business, it will be unnecessary for me to say more in this, than that I appreciate as highly your distinguished conduct on the memorable occasion in question, as if it had been noticed by those whose duty it was to notice it in a manner commensurate to your merits. It is easy to form an opinion why more ample justice was not done you; but upon this head it may perhaps be more prudent to be silent—more especially as you may take my word for it, that there is but one opinion as to the credit which you have done yourself, and the remuneration which you are entitled to.

"It is a great satisfaction to me to find that the Canadian Militia, both embodied and sedentary, have behaved so well; and when it is considered how insufficient the Militia laws are to the proper government of the men upon military principles, I think your merit in having brought your Voltigeurs to the state of perfection which, I understand, they have attained, is beyond all praise.

"With respect to yourself, I will tell you candidly my wish is, when a proper opportunity offers, to get you promoted to the rank of Colonel, by being nominated an honorary A.D.C. to the Prince Regent; and then, some day or other, appointed Colonel-Proprietaire of the Canadian regiment—which will then thrive under you, and enable you to remain in your own country, with benefit to that and honor to yourself. So do not think of quitting the army upon any consideration, while there is not a chance of your being removed from the defence of your *Dieux Penates*. As to your worthy father, the granting him his full pay for life, upon retirement, was but an act of jus-

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tice; and the withdrawing of that grant afterwards, most unjustifiable, and I do not wonder it should have hurt you; but times may alter.

"Repeating, as I conclude, the sentiments of friendship and esteem, with which I ever am, my dear DeSalaberry,

"Yours faithfully,

(Signed,) "EDWARD."

This was the sensible and suitable way in which H. R. H. proposed to reward the great service of DeSalaberry. Let us see what was actually done. Great Britain commemorated the victory, by causing a medal to be struck; the Voltigeurs were presented with colors; and DeSalaberry, besides the gold medal, had the Order of the Bath conferred upon him--transmitted, with an autograph letter, from the Prince Regent. The two houses of Provincial Legislature passed a vote of thanks to him; and his father's pension, which had been "most unjustifiably withheld," was restored. This was all; and we must admit a most inadequate recompense it was.

Col. DeSalaberry was selected by Sir George Prevost to take a share in an expedition against the enemy at Salmon River. In addition to his own Regiment, four companies of the 49th Regiment marched with him to Coteau du Lac; but the expedition was given up.

In April, 1814, he was sent into L'Acadie, with 1,800 men, to attack General Wilkinson; but that General had retreated from Odelltown, before he could cross the inundated roads, In July, 1814, he was again sent to Odelltown, with 2,200 men and some artillery, the greater part regulars, to make head against the American General, Izard, who was intrenched at Champlain and menaced L'Acadie with 6,000 men. Soon after this, the British troops arrived from France; peace was concluded, the Voltigeurs were reduced, and DeSalaberry, being reduced to half-pay, retired to his home at Chambly. In 1818 he was called to the Legislative Council—his father being still a member; and in this position he remained till death. The elder died in 1828.

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In explanation of the allusions made in the notice of O'Sullivan, and the letter of the Duke of Kent, I may say that they arose from an attempt made, in certain quarters, to deprive DeSalaberry of his just fame. In order to place this matter in its true light, I have placed in the Appendix documents which speak for themselves, and cannot be gainsaid.

DEATH OF THE HERO OF CHATEAUGUAY.

Colonel Charles-Michel DeSalaberry, like his father, was always fond of the society of the young. In 1829 he was spending the evening at the house of the Hon. Mr. Hatt, at Chambly, when a young lady, to whom he was much attached, prevailed upon him to dance a reel with her: he danced so spiritedly and long, that his eldest son, who was present, glided in before his partner and assumed his place. On ceasing to dance he withdrew to an adjoining room, and throwing himself on a couch, said to a young medical friend, who chanced to be there, "I feel very unwell!" and almost immediately became speechless, but retained his other faculties. He was bled, and on the following day Dr. R. Neilson arrived from Montreal, when he was again bled; but human skill was in vain.

"At length no more his deafened ear the minstrels' melody can hear,
His face grows sharp; his hands are clenched, set are his teeth; his fading eye
Is sternly fixed on vacancy."

The strong man, "in manhood's glory," expired at the early age of 51. Madame DeSalaberry survived many years, and his children are still with us—Lieut.-Col DeSalaberry, D.A.G., being the representative of the family.

Some men are born great, some achieve greatness, and some have greatness thrust upon thm. If the hero of our story was not born great in a world-wide sense, he had the fortune to be born of one of the oldest and most distinguished French Canadian families, so that it may be said fortune smiled on his birth. Greatness was not thrust

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upon him; but here again fortune was propitious and afforded opportunities of advancement possessed by few. That he achieved greatness few will be disposed to deny;—the warmhearted, generous, chivalrous friend; the loyal subject; the brave, the prudent, and the skillful soldier; the Canadian Leonidas; the victor at Chateauguay; the saviour of Canada—will never pass from the admiration and affection of his own countrymen, and his name will flourish in immortal youth wherever the tale of his great exploit at Chateauguay shall be told. May our country never want subjects as loyal and brave as DeSalaberry; and may she learn how better to reward them!

I cannot close this paper without making one more allusion to the Prince who occupied so prominent a part in it. His letters to the DeSalaberrys, extending over a period of more than twenty years (some of them sixteen pages in length), give us a true index of his character, and exhibit him as a warm-hearted, considerate, and discreet friend—above all, truthful and faithful: indeed, if it could with propriety be said of mortal man, that he was "without variableness or shadow of turning," it might in all truth be said of him, who, being a King's son, was further nature's *nobleman*. Had he lived, there can be little doubt Canada would have felt the benefit of his wise and liberal counsels; and that justice would have been done to DeSalaberry which, I regret to say, has not been rendered to himself or family.

The Duke married, on 29th May, 1818, the sister of the late King of the Belgians, the widow of the Prince of Leinengen; and, on 24th May, there was born to him at Kensington Palace, a little daughter, now our most gracious Sovereign Queen Victoria. On the 29th December, 1819, he wrote from Walbrook Cottage, to a friend:—"My little girl thrives under the influence of a Devonshire climate, and is, I am delighted to say, strong and healthy—*too healthy*, I fear, in the opinion of some members of my family, by whom she is regarded as an intruder; how largely she contributes to my happiness at this moment, it is

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needless for me to say to *you*, who are in such full possession of my feelings on the subject."

This was one of his last letters, as he died, after a few days' illness, of inflammation of the lungs, on the 23rd Jan., 1820, in the 53rd year of his age and the full vigor of manhood, prematurely cut off when he was most wanted to protect his wife and infant daugther, and just when his noble nature and manly virtues, which had been so long misunderstood and misrepresented, were beginning to be appreciated in England.

The Third Period of the History of Canada culminated in the unhappy rebellion of 1837-8. There is neither time, nor is this the place, to enter into the consideration of the causes which led to that outbreak; but I would recommend all who have not already heard or read it, to refer to the able paper on the History of Canada, by Mr. John W. Cook, which has been published in this year's transactions. It may, however, be remarked, that there must have existed during the period a fair measure of prosperity, as the population, which at the conquest was only 65,000, had then increased to about 465,000 in Upper Canada, and to 690,000 in Lower Canada—making a total of 1,155,000.

The Fourth Period of Canadian History is to be dated from the Union of the Provinces in 1841, when the population in the Upper Province amounted to 465,375, and in the Lower to 690,782—making a total of 1,156,157. The Union, we are aware, was objected to by Upper Canadians, on the ground that it would destroy the character of Upper Canada as a British Province. In Lower Canada it was asserted, that French Canadian influence would be rooted out for ever, and that the stipulations and guarantees would be violated. We are now about to enter upon a Fifth Period; and it will be useful to turn to statistics to see how far these anticipations have been realised. We find that at the present moment the population of Upper Canada is given by Mr. Arthur Harvey, a careful and reliable statist, at 1,802,056; that of Lower Canada at 1,288,880—making a total of 3,090,936. And of these there

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are of French origin in Upper Canada 33,287, and in Lower Canada 847,320—making a total of French origin of 880,607; giving an increase of 183,825 over the *whole* population of Lower Canada at the time of the Union. Then, as to the great question of Religion: so complete has been Civil liberty, so perfect the "freedom to worship God," that we find our fellow-colonists of the Roman Catholic Church numbering forty-five per cent. of the population of the united Province. I think this requires no comment; so I shall conclude with a short extract from Mr. Cook's paper:—"The great national progress which Canada has achieved since the Union of the two Provinces, has been accompanied by progress of a higher order. Schools, colleges and universities have sprung into existence. As the education of the people advances, it will be easier to work well and wisely a system of government, which greatly depends for its success on the information possessed by the people. A broader and greater Union is advocated by our ablest statesmen, under the full sanction of Imperial authority. A national spirit is gradually growing and strengthening. Nor need the fact, that the population of Canada is sprung from different races, be a source of weakness. French and English, Scotch and Irish, may well retain the traditions of their fathers, and be at the same time good and loyal Canadians. They may cherish the memories of the old lands, while uniting in defence of the new, in which God has blessed them with a healthy climate, a productive soil, and a free government."

APPENDIX

"Right's House, Chateauguay River,
"27th Occtober, 1813.

"Advance Brigade Orders.

"Majer-General De Watteville has much satisfaction in conveying to the troops composing the advance, by desire of his Excellency the Commander of the Forces, the high

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sense which his Excellency entertains of the conduct of the several corps engaged with the enemy in the affair of yesterday, under the immediate command of Lieutenant-Colonel DeSalaberry.

"His Excellency was pleased to express his entire approbation of the discipline, coolness and bravery displayed by all ranks on this occasion, which reflects the highest honor upon all concerned.

(Signed,) "GEO. F. BURKE,
"Major of Brigade."

"Head Quarters, La Fourche,
"On the Chateauguay River,
"27th October, 1813.

"General Orders.

"His Excellency the Governor-in-Chief and Commander of the Forces has received from Majer-General De Watteville, the report of the affair which took place in front of the advanced positions of his post, at 11 o'clock on Tuesday morning, between the American army, under the command of Major-General Hampton, and the advanced piquets of the British, thrown out for the purpose of covering working parties, under the direction of Lieut.-Colonel DeSalaberry; the judicious position chosen by that officer, and the excellent disposition of his little band, composed of the light company Canadian Fencibles, and two companies Canadian Votigeurs, repulsed with loss, the advance of the enemy's principal column, commanded by General Hampton in person, and the American Light Brigade, under Colonel McCarty, was in like manner in its progress on the south side of the river, by the gallant and spirited advance of the flank company 3d Embodied Militia, under Capt. Daly, supported by Captain Bruyer's company of Sedentary Militia. Captains Daly and Bruyers being both wounded, and their companies having sustained some loss, their position was immediately taken up a flank company of the 1st battalion Embodied Militia. The enemy rallied and repeatedly returned to the attack,

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which terminated with the day in his complete disgrace and defeat, being foiled by a handful of men not amounting to a twentieth part of the force opposed to them, but which nevertheless by their determined bravery maintained their position, and screened from insult the working parties, who continued their labors unmolested. Lieut.-Col. DeSalaberry reports having experienced the most able support from Captain Ferguson in command of the light company Canadian Fencibles, also from Captain Jean Bapt. Duchesnay, and Captain Juchereau Duchesnay of the two companies of Voltigeurs; from Captain Lamotte and Adjutants Hebden and O'Sullivan, and from every officer and soldier engaged, whose gallantry and steadiness were conspicious and praiseworthy in the highest degree.

"His Excellency the Governor-in-Chief and Commander of the Forces having had the satisfaction of himself witnessing the conduct of the troops on this brilliant occasion, feels it a gratifying duty to render them that praise which is so justly their due: to Major-General De Watteville for the admirable arrangement established by him, for the defence of his post; to Lieut.-Colonel DeSalaberry for his judicious and officerlike conduct displayed in the choice of position and arrangement of his force; to the officers and men engaged with the enemy, the warmest acknowledgments of his Excellency are due, for their gallantry and steadiness, and to all the troops at the station the highest praise belongs for their zeal, steadiness and discipline, and for the patient endurance of hardship and privation which they have evinced. A determined perseverance in this honorable conduct cannot fail of crowning the brave and loyal Canadians with victory, and hurling disgrace and confusion on the head of the enemy that would pollute their happy soil.

"By the report of prisoners, the enemy's force is stated at 7,500 infantry, 400 cavalry, and 10 field pieces. The British advanced force actually engaged did not exceed 300. The enemy suffered severely from our fire, as well as from their own—some detached corps having fired upon each other by mistake in the woods.

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"Canadian Light Company had 3 rank and file killed: I sergeant, 3 rank and file wounded.

"Voltigeurs, 4 rank and file wounded.

"3rd batt. Flank Company, 1 captain wounded: 2 rank and file killed, 6 wounded, 4 missing.

"Chateauguay Chasseurs, 1 captain wounded.

"Total—5 rank and file killed: 2 captains, 1 sergeant, 13 rank and file wounded, and 4 missing.

"Officers wounded—Captain Daly, 3d Embodied Militia, twice wounded severely, but not dangerously; Cat. Bruyers, Chateauguay Chasseurs, slightly

(Signed,) "EDWARD BAYNES, Adjutant-General."

Advance Post, 1st November. 1813.

"Sir,--Referring to the General Order of the 31st ultimo, issued in consequence of the action in which I repulsed General Hampton's army, I observe, with regret, that the choice of the several positions which I defended, is not attributed to me,—neither is the disposition of the force, which was immediately under my command, understood to have been altogether mine; from which the greater part of the merit (if any there was for contending against a whole army for the space of four hours) is taken away from me. To elucidate this matter, it appears necessary I should state, that, when it was reported on the 21st ultimo at Chateauguay church, at night, the enemy had surprised the picket at Peper's Road, I was desired to move with my corps to English River; and finding, when there, that the enemy's intention appeared to be to move down the River Chateauguay, on his way to Montreal, I lost no time in pushing on the troops, and took up the three advanced positions, and began to fortify them as well as I could (having then only few axes) and distributed the troops for their defence. I ordered also the famous abattis, situated two miles in front of the above-stated positions, to which I marched on the 26th; from whence I re-

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connoitered the American army in the act of advance; from whence I completed my dispositions for the defence of both sides of the Chateauguay; from whence after an obstinate engagement of four hours, I succeeded in defeating their project of penetrating into the country, and finally obliged him to retire to his former position, five miles back, with the loss of about seventy killed and sixteen prisoners, besides a great number of wounded, about one hundred and fifty stand of arms and six drums, &c., &c. which fell into our hands. Moreover, he has since retired into his own country.

"It is true General De Watteville inspected my positions and approved of them, and of the orders I had given for their defence. The dispositions to receive the enemy on the 26th were made by myself: no one interfered with them; and no officer of superior rank came up till after the action was over. It is true I was ably seconded by Lieut.-Col. McDonnell, of the Glengary Fencibles, who had taken up the fourth position two days before the action, and by all the officers under my command.

"I regret also to observe, in perusing the order of the 27th, that it is supposed I had been thrown forward to cover working parties. This idea is erroneous, inasmuch as there were no works carrying on there but such abattis and defences as appeared to me necessary to prevent my positions from being outflanked or forced. Those I ordered myself—no engineer directed them. I placed myself in front of the abattis, with the view to begin the defence of the country. I judged it a good position, from whence I could have a good view of the enemy's columns, which, I was apprised, were in full march. This I did of my own accord. It was a desperate undertaking—it succeeded; and the enemy, instead of going to Montreal, is gone to Four Corners.

"The enemy's intention is ascertained by concurring circumstances, and by the report of prisoners. He was not, then, in full march, with all his baggage and artillery, for the purpose of only attacking a few workmen.

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"These are the true circumstances attending the action on the 26th; and it grieves me to the heart to see that I must share the merit of the action, and that it must be reduced to my having covered a few workmen. Methinks, if any merit is to be obtained, I am entitled to the whole.

"I cannot conclude without soliciting that this representation may be placed before His Excellency the Governor General, to whose justice I confidently appeal.

"I have the honor to be, Sir,

"Your most obt. humble servant,

"CHAS. DESALABERRY,

"Lieut.-Colonel, commanding Voltigeurs.

"To the Adjutant-General."

Extract of a General Order, dated—

"Adjutant-General's Office,

"Head-quarters, Montreal, 4th Nov., 1813.

"His Excellency the Governor-in-Chief and Commander of the Forces has the highest pride and satisfaction in declaring his acknowledgments to the loyal and brave Militia of Lower Canada, for the zeal and alacrity with which they flew to their posts, and for the patience and firmness with which they have endured, in this inclement season, the severe hardships and privations to which they have been exposed. The steadiness and discipline of the whole have been conspicuous; and the undaunted gallantry displayed by six companies, almost to a man composed of Canadian Fencibles and Militia, under the immediate command of Lieutenant-Colonel De Salaberry, in repelling, with disgrace, an American invading army, twenty times their number, reflects unfading honor on the Canadian name.

(Signed,) "EDWARD BAYNES,

"Adjutant-General."

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"Head-quarters, Montreal,
"18th April, 1814.

"I am directed by the Commander of the Forces to transmit, enclosed for your information and for the information of the detachments concerned, the copy of a letter His Excellency has just received from the Commander-in-Chief, expressive of His Royal Highness's satisfaction at the good conduct displayed in the affair on the Chateauguay.

"I have the honor to be, Sir,
"Your most obedient humble servant,
"NOAH FREER,
"Military Secretary.

"To Lieut.-Colonel Chas. DeSalaberry,
" Inspecting Field Officer, Militia Lt. Infantry."

(Copy.) "Horse Guards,
"24th December, 1813.

"Sir,—I am to acknowledge the receipt of your Dispatch of the 30th October last, respecting the very gallant and successful resistance made by the detachments under the command of Lieut.-Colonel DeSalaberry, against an attack of a very superior body of the enemy's army, led by Major-Gen. Hampton in person, upon the advanced posts, near the Chateauguay River;—and I have derived much satisfaction from receiving so flattering an account of the eminent skill and determined bravery displayed by the officers and men of the very small portion of the Regular Troops and Militia employed on this occasion; and I shall not fail to bring their conduct under the gracious consideration of the Prince Regent.

"I am, Sir, yours,
(Signed,) "FREDERICK,
"Commander-in-Chief.

"Lieutenant-General
"Sir George Prevost, Bart.,
" &c., &c., &c.,
" Canada."

"A true copy.
"NOAH FREER,
"Military Secretary."

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"House of Assembly,

"Tuesday, 25th January, 1814.

"Resolved, *nemine contradicente*, that the thanks of this House be given to Lieutenant-Colonel DeSalaberry. of the Canadian Voltigeurs, and the several other officers under his command, for their distinguished exertions on Tuesday, the twenty-sixth day of October last, in the glorious action on the Chateauguay River; and that the Speaker of this House have it in charge to signify the same to the said Lieutenant-Colonel DeSalaberry and the several other officers, that this House doth highly feel and acknowledge the distinguished valour and discipline so conspicuously displayed by the non-commissioned officers, private soldiers and militia men of the little band under the immediate command of Lieutenant-Colonel DeSalaberry, in the signal defeat of the American army, under the command of General Hampton, at Chateauguay aforesaid; and that the same be signified to them by the commanding officers of those corps, who are desired to thank them for their gallant and exemplary conduct.

"Attest. WM LINDSAY, JR.,
"Clk. Assembly."

"Quebec, 11th March, 1814.

Sir,—I have the honor to transmit to you the thanks of the Legislature Council of this Province, unanimously voted on the 2nd of February last to yourself, and to the officers and men under your immediate command, for 'distinguished conduct and bravery in the action of the 26th 'October last, on the River Chateauguay, when a small 'but heroic band of native troops repulsed the advance of 'the American army, under General Hampton.'

"Upon an occasion so exclusively and so highly honorable to His Majesty's Canadian subjects, in which loyalty, courage, zeal and ability were equally conspicuous, I have

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the highest satisfaction in obeying the order of the Legislative Council, which directs me to signify their thanks to you, and to request that you will communicate them to the officers and men, to whom they have reference, in the way which you may deem proper.

"I have the honor to be, Sir,

"Your most obt. and very humble servant,

"J. SEWELL,

"Speaker Legislative Council,

"Lower Canada.

"Lieut.-Col. DeSalaberry."

"Adjutant-General's Office,

"Head-quarters, Quebec, 26th March, 1814.

"General Orders.

"His Excellency the Governor-in-Chief and Commander of the Forces feels the highest gratification in obeying the commands of His Royal Highness the Prince Regent, transmitted in a letter from the Right Honble. the Earl Bathurst, one of His Majesty's Principal Secretaries of State, of which the following is a copy, and which His Excellency directs to be published in General Orders, and read at the head of all corps in this command:—

"'His Royal Highness has observed with the greatest satisfaction the skill and gallantry so conspicuously displayed by the officers and men who composed the detachment of troops opposed to General Hampton's army. By the resistance which they successfully made to an enemy so vastly disproportionate, the confidence of the enemy has been lowered, their plans disconcerted, and the safety of that part of the Canadian frontier ensured. It gives his Royal Highness peculiar pleasure to find, that His Majesty's Canadian subjects have at length had the opportunity (which His Royal Highness has been long anxious

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should be afforded them) of refuting, by their own brilliant exertions in defence of their country, that calumnious charge of disaffection and disloyalty with which the enemy prefaced his first invasion of the Province.

" 'To Lieutenant-Colonel DeSalaberry, in particular, and to all the officers and men under his command, in general, you will not fail to express His Royal Highness's most gracious approbation of their meritorious and distinguished services. His Royal Highness has commanded me to forward to you, by the first safe opportunity, the colours which you have solicited for the embodied battalions of the Militia, feeling that they have evinced an ability and disposition to secure them from insult, which gives them the best title to such a mark of distinction.'

"By His Excellency's command,

"EDWARD BAYNES,

"Adjutant-General, N. A."

"To His Royal Highness the Prince Regent of the United Kingdom of Great Britain and Ireland, &c.

"May it please your Royal Highness, we, the faithful subjects of His Majesty, the Commons of Lower Canada in Provincial Parliament convened, most humbly beseech your Royal Highness to take into your most gracious consideration the services which Lieutenant-Colonel Charles DeSalaberry has rendered to his country, by his skill and courage, in the glorious affair of 26th Oct., 1813, on the River Chateauguay, in repulsing, at the head of three hundred of his country-men, a division of the American army, under the command of General Hampton, disconcerting the plans of the enemy, diminishing his confidence, and securing the safety of the Province.

"Therefore His Majesty's most faithful Commons most humbly pray, that your Royal Highness will be pleased to take into consideration these most distinguished services,

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so as to stimulate in the future the emulation of our compatriots for the defence of this Province against the enemies of His Majesty; and ordain that a grant of the lands of the Crown be made to Lieutenant-Colonel Charles De-Salaberry, or to issue any other order which, in your Royal Highness's opinion, may be suitable.

"Address passed 20th March, 1815."

Extract of a letter from the Duke of Kent, dated—Kensington Palace, 15th June, 1814:—

"I am most happy to tell you that, however the Commander of the Forces may have sought to obscure your high and distinguished merit for your gallant cool conduct in the affair of Chateauguay, it is not the less appreciated on this side of the water; for it has appeared evident to every reader of the public despatches, that to you the public are indebted, as the gallant leader of the heroic band, for the glorious result of the business. I have only to add my hearty good wishes for your health, happiness and prosperity, and to assure you of the friendly regard and sincere esteem with which I shall ever remain,

"My Dear DeSalaberry,

"Yours faithfully,

"EDWARD."

Extract from *Montreal Gazette*, 22nd August, 1817:—

" We understand that Lieut-Colonel Charles De Salaberry, late commanding the Canadian Voltigeurs, has been appointed member of the Legislative Council. It is said that the mandamus has lately arrived. However trifling this mark of distinction, when compared with the character of that distinguished officer, we are gratified to see it conferred on him by Government, in the absence of any other recompense for his meritorious services."

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(Translation.)

"Kensington Palace,

"15th March, 1814.

"My dear DeSalaberry,—On 31st December, I received your interesting letter of 10th November, in which you give me an account of the advance of the Canadian army on 27th October, and of the brilliant affair which your son gained by his arrangements. I received at the same time his letters, in which he gave me the details; and I hesitate not to declare my opinion, that you have reason to be proud of the victory gained by my *protégé* over forces so superior in numbers to those which he commanded,—but also that he displayed talents and judgment rarely to be found, unless in veterans, both in making his dispositions and during the battle.

"I have seen, with pain, that the report of the Adjutant General does not do him justice, as he does not give him exclusive credit for the dispositions made, and the success which resulted from them. But you may confort yourself with the idea, that there is not any one here who does not regard him *as the hero who saved Lower Canada*, by the decisive steps which he took and the bravery with which he opposed his little band of heroes to the troops of the enemy, so superior in numbers. I have talked the matter over with the Duke of York, and he appears completely convinced that to your son belongs the whole merit; and I have no doubt he will find occasion to reward him in a manner appropriate to his desire and merit. You may rest assured that this is the effect produced by the reports of the English officers who were present and witnesses of the affair.

"I must confess that, for a moment, I had very great fears for Canada, after the disgraceful defeat of General Proctor, and the defeat of our navy on Lake Erie; but the recent success of my friend, Lieutenant-General Drummond, has given me hope, and as the Government have made considerable efforts to re-establish our superiority

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on the lakes, I anticipate that during the coming summer the face of things will be changed entirely to your advantage. This is the more likely, as it now appears that things on the continent are about to terminate with honor.

"Madame De St. Laurent, who is confined to her room by severe indisposition, will not be able to write you by this mail, as she desired, but has commissioned me to convey to you and Madame DeSalaberry and all your family a thousand regards; and I take the opportunity to renew those sentiments of friendship and affection with which I always am,

"Dear DeSalaberry,

"Yours most affectionately,

"EDWARD.

"Lieut.-Colonel DeSalaberry, Sen.,

"Beauport,

"Quebec."

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PAPER III.—THE FUTURE COMMERCIAL POLICY OF BRITISH NORTH AMERICA.

BY T. H. GRANT, ESQ., SECRETARY OF QUEBEC BOARD OF TRADE.

(Read before the Society, March 20th, 1867.)

"PROTECT INDUSTRY, AND IT WILL PROSPER."

"Such part of the Natural History of Canada as regards wild animals is that which hitherto has received the greatest attention, on account of the commercial advantages derived therefrom. The animals which are to be principally found in our woods, are stags, elks, deer, bears, foxes, martens, wild cats, ferrets, weasels, squirrels ,hares, and rabbits. The southern parts, in particular, breed great numbers of wild bulls, divers sorts of roebucks, goats, wolves, &c. The marshes, lakes and pools, with which this country abounds, swarm with otters and beavers, of which the white are highly valued. The commerce in these articles, however, though at present of importance, must of necessity take a second rank, when compared with other branches, which must eventually arise. The productions of agriculture must ultimately be the staple commodities of the country;—and, even now, the fisheries might, with care and attention, be made to yield a return far superior to any derived from the trade in peltries."

Not half a century ago, an English gentleman, compiling a political and historical account of Canada, uttered the above truthful and prophetic language. Though at that time over three hundred years had elapsed since the day when Sebastian Cabot first landed on the south-west shores of the St. Lawrence—though the country had been alternately under French and British rule, and the civilizing influence of christianity had felt its way amongst the people, they had not learnt to dignify commerce by any

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other employment than that of hunting bears and foxes, and chasing wild cats and deer. True, the farmer raised his wheat, oats and corn; the fisherman kept the markets supplied with the products of the lakes and streams; and an occasioned ship brought to hand what were called English luxuries,—tea, broad cloths and calicoes. Manufacturing, too, was not unknown amongst the people; for we are told that in their own households were made the soap and candles they consumed, the sugar they used, the shoes and moccasins they wore, and the greater part of their clothing. Partial researches into the aspect of the country had led to the discovery of a few iron and copper mines, and slate and marble quarries; still the country, though three centuries old, was yet in its infancy—these were but the germs of its future growth and prosperity. Far-seeing, reflecting men, predicted a successful career; and agriculture and the fisheries were to be the means to this great end.

Who is there to-day that, looking back into the history of those last fifty years, and comparing the past with the present, will not stop in amazement at the rapidity of our growth, the magnitude and variety of our improvements, and the solid character of our progress. Agriculture has, indeed, become the staple of the country, and British America is now enabled with her large surplus to supply cheap food to countries that half a century ago hardly knew of her existence. The fisheries have yielded up their wealth, and the vast waters of this northern continent of ours, from the banks of Lake Huron to the shores of Newfoundland, present a fishing ground unequalled in extent and richness. But these are not the only elements of our success. Commerce has not been idle, but, following in the track of the Mother Country, has extended her march throughout the world, so that British American ships may now be found on every sea, carrying home to us the products of foreign lands. That most important branch of industry—our manufactures—has also contributed in no small degree to our prosperity, and, if properly encouraged, must hereafter prove a source of great wealth to our people.

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Four millions of British subjects are shortly to be united under one Government, enjoying all the privileges of a favoured people, and inheriting all the qualities of a race, whose virtues, influence and fame may be heard and felt in every quarter of the globe. In starting on this new career, with a smiling prospect before us, and a powerful arm to support her, the Government of the Dominion of Canada must so shape its policy, and direct its legislation, as to open up every avenue of trade, and foster and strengthen every branch of industry.

What that policy shall be, will be fruitful subject of discussion for some time to come. Various opinions are entertained by leading men in the Provinces as to the best mode of regulating the fiscal laws of the country, so as to stimulate and encourage the many industrial and commercial interests, and at the same time provide for the ordinary revenues. The extraordinary success of free-trade principles in Great Britain, and the great progress that has attended their operations in other countries, as well as the persistent efforts of financial reformers in England to abolish all duties, and resort to direct taxation, render very difficult the task of him who propounds any doctrine of a Protective character. And this is the case with the speaker. Educated by training and judgment to approve and admire the policy inaugurated by Sir Robert Peel, and fully aware of the inestimable benefits which it has conferred on the British people, he finds himself compelled, in view of the future greatness and independence of British America, to select as his motto that which heads this Essay —"Protect Industry, and it will prosper."

It is the opinion of most persons who have given the subject any attention, that the policy which has been pursued in Canada for some time past, of affording incidental protection to native industry, is the one which ought to be followed under Confederation. This opinion I cheerfully endorse, for if the skilful artisan, the respectable mechanic, and the inventive genius of our race, whether emi-

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grant or native born, are to be induced to settle permanently in British America, we must protect the means by which the fruits of their skill and labour may be made profitable to them and the country. Let us take a glance, then, at the fiscal policy and commercial state of Great Britain, previous and subsequent to 1842, the year in which Sir Robert Peel inaugurated his epoch of financial reform, and see how far it compares with the present condition and future prospects of the British North American Provinces.

The long and expensive wars in which England had been engaged during the latter part of the last and the beginning of the present centuries, and the gross mismanagement and wilful extravagance of the government, had plunged the country so deeply in debt (the American war alone costing one hundred and forty millions pounds sterling), led to the imposition of duties that weighed with destructive force upon all the springs of industry. The first necessaries of life—indeed the very essentials—without which it cannot be maintained, are food and shelter; and these, as well as fuel and clothing, were so enhanced in price, as to be placed beyond the reach of millions. The oppressive tax upon corn; the onerous burdens inflicted upon tea, sugar, cheese, butter and beer; the tax on timber and bricks; the prohibitive duties on foreign products; and the enormous excise imposed upon home industry, which some years exceeded in amount the revenue from customs, had so paralysed every branch of trade ,as to call forth murmuring notes of discontent from one end of the kingdom to the other. An agitation for the repeal of the corn laws, and the amelioration of other burdens, awakened the attention of the Government, and emboldened the Whig ministry of 1841 to attempt some fiscal reforms. In 1837-8-9-40 there had been a growing deficiency in the exchequer, arising in part from increasing expenditure, partly from decay of trade under bad harvests, and partly (indeed chiefly) from the *restrictions on trade* and the heavy taxes. New debts were contracted,—first by the issue of exchequer bills, then by these being

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funded and added to the national debt. In 1840 an Act was passed granting additional duties on customs, excise, and assessed taxes: the additions being five per cent. on customs, except on spirits, grain or flour, imported; on excise, five per cent.; and ten per cent. on assessed taxes. This scheme brought no additional revenue; but a profound truth was put to the proof, namely,—that taxation had a limit, beyond which it cannot be imposed, at which it will summarily arrest consumption. The Whigs, as a last resort, yielded to the demand for financial and commercial reform, by proposing alterations in the duties on corn, sugar and timber; but they were driven from office, and Sir Robert Peel and his party, as *Protectionists*, admitted instead. Then followed the scheme of that man to relieve the people from the oppression under which they groaned, and which was followed by a marked improvement in trade and comfort. The income tax was imposed; and the extension of the four-shilling duty on the exportation of coal, hitherto partial, to all exportations of that article. This would give a revenue ample to supply the deficit, and leave a large surplus, which was to be applied in the largest reduction in commercial taxation ever contemplated by Cabinet or Parliament. Out of twelve hundred articles subject to duties, seven hundred and fifty were to be reduced. The first principle was, the Minister said, to remove prohibitions, and the next to reduce duties on the raw materials of manufacture to five per cent., or less; on articles partially manufactured to twelve per cent., and on manufactured to twenty per cent. The beneficial effects of this policy were immediately felt, in the increase of every branch of trade, and a general improvement in the condition of the people. The change did not come too soon; for it was obvious that, with an increasing expenditure in taxes and food during the war period, from 1792 to 1815, if it had not been for countervailing circumstances of an extraordinary kind, the national industry could not have been sustained under the depression. The many mechanical inventions of the time had increased enormously the productive power of the nation, and by, relatively to food, cheapening and extending the supply of

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other necessaries of domestic comfort, rendered the payment of heavy taxes possible, which otherwise would have been impossible.

Now, it is the prevailing opinion amongst the great majority of absolute free-traders in this country, that the real cause of the grievances under which the British public laboured, previous to the repeal of the corn laws, was the high price of bread, and the taxes on imports. This is an error. While it must be admitted that the English people suffered considerably from the dearness of bread, caused by the prohibitive duties on wheat, still it cannot be denied that the primary evil which afflicted them was the intolerable burdens imposed on the national industry. Enormous duties were put upon the raw material, running from 50 to 500 per cent., and on the manufactured article an excise so great as to become positively oppressive. The effect of this was to enhance the price of all commodities to the consumer—to deny them to a large portion of the population—to prevent competition and creat huge monopolies, and to curtail and limit the productive power of the manufacturer. In addition to this, there was a war of material injuries going on between the Continental states and Great Britain, directed against the importation of foreign commodities, which led to the celebrated Berlin and Milan decrees, preventing, at least as far as the influence of France could effect it,any intercourse with England. These were the causes which led to the free-trade policy of Sir Robert Peel, who although he removed the excise duties on manufactures, and reduced the tax on the raw material, deemed it necessary to maintain a protective duty of from 25 per cent. to 30 per cent. on foreign productions.

Having thus glanced very briefly at the prohibitive and free-trade career of England, let us see how far British America at present compares with her in its adaptability to an exclusively free-trade policy.

At the period of which I speak, the resources of Great Britain had been fully developed, and her productive

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power attained to such a degree of perfection, that it struggled for competition in the markets of the world. Extravagant expenditure and costly government had so shackled its free operation, that the very elements of its growth and vigour would have caused its decay if the obstacles to its expansion had not been removed. Under a protective tariff, it had grown and prospered, and, confident in its strength, it sought for freedom of action. In British America to-day quite an opposite state of things prevails. Here, manufactures are in the incipient stages of growth: they are just starting into life. Competition, it is true, is the life of trade, where trade is vigorous, just as the blood is the life of man—the more freely it flows through and permeates the body, the more force and vitality it gives to the system. But new enterprises, in a young country especially, require the aid of a fostering government, just as the sapling needs care and nourishment until it is strong enough to stand alone. While competition in England has not only carried her productions all over the world, but, by the introduction and perfecting of skilled labour, has considerably improved them; competition in these Provinces would destroy native industry, because we have not the power to compete with older and wealthier countries,such as Great Britain, France, Germany, and the United States. The chief elements of a manufacturing trade, according to the old political economists, are capital, labour, and material; to which must now be added—skill, and steam power. In every one of these essentials, we are excelled by the countries just named. Even Russia, and powerful as she is, is obliged, in self-defence, to maintain a tariff so high, that it almost amounts to prohibition.

It will be conceded, without argument, that we are very deficient in capital; and this is one of the chief obstacles we have to contend with. England, on the contrary, has more money than she can profitably employ at home, and is obliged to seek investment abroad. In England, too, money can be obtained at less than one-half what it can be procured for in Canada. In France, a mechanic of small means

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and good character can obtain a loan from the Bank of France, the Savings' Department of that institution having been specially established by the Emperor to facilitate the enterprise, and encourage the industry of the respectable artisan. To-day there is not sufficient capital in British America for its legitimate wants, and in a number of instances many a promising undertaking has failed through want of means to support it. From this cause, competition amongst ourselves—a most desirable thing to cultivate—has been suspended, and in several branches of trade there is to be found an almost entire monopoly.

As regards labour, and skilled labour, especially, the manufacturing nations of Europe have a decided advantage over us. The amount of poverty prevailing everywhere, the number of poorhouses and benevolent societies existing in all the chief cities, are convincing proofs that the supply of labourers far exceeds the demand; and, in Germany and England particularly, the wages which the work man receives are so small as barely to enable him to keep body and soul together. As regards the cost of production, labour is the chief item, and this is obtained at so low a rate from amongst the teeming populations of the old world, and in England especially, that competition is reduced to a minimum. In British America there is no absolute scarcity of labour; but, owing to the superior condition of the people, the effect of constant high wages in the United States, and the numerous and varied resources open to the working man on this continent, he can always command a much higher rate of wages. Thus, in addition to the scarcity of capital, or the excessive rate of interest, which the manufacturer is compelled to pay for its use, he has to contend against the additional disadvantage of a much higher rate of wages. This, however, is not a matter of regret; for if the manufacturing interests on this continent are to be fostered by sacrificing the comfort and happiness of the artisan, as they are in the old world, it were better we had no manufactories at all. Such, nevertheless, are the difficulties they have to encoun-

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ter at present, that if the existing protection were removed, a reduction of wages would be the immediate result; and with heavy annual expenses and a large public debt, which Confederation will rather increase than diminish, there is no possible chance of relief by a reduction of the duties upon imports. There is also, in connection with this subject, the question of skilled labour. During the last twenty years a marked revolution has taken place in the quality of the labour employed in the factories of the world. Industry is not now supported by mere manual labour, but by a competition of intellect. The scientific principles involved in manufactures are taught in schools, which are to be found in every town in Europe; while each metropolis can boast of an industrial university, teaching the alphabet of science, as applied to manufactures. In England, foreign talent has been employed to a great extent, and skilled artisans from France, Belgium and Germany may be found in all the chief factories of Manchester, Birmingham, Sheffield, &c. In the present state of our manufactories in these Colonies we cannot afford to import designers to produce patterns, and pay them liberal salaries; and our own mechanics, as a general rule, do not possess the scientific knowledge that will qualify them to originate improvements in management, skill and execution. For a time, therefore, we must be content to follow and imitate—to send our capital abroad as a premium to that intellectual progress which we should enjoy at home. Here, then, is another barrier to the successful development of our industrial interest under an absolute free-trade policy,—and it is a barrier so formidable that it becomes the duty of the Government to remove, if they would promote the future prosperity of the country. An able writer of the present day says, on this question:—"If the main object of life were to fabricate *literati*, I would not dispute the wisdom of making classics the groundwork of our education. They are not utterly dead, but, like the dry bones of the valley, they may come together, and have breathed into them the breath of life. Classical literature and exact science are, however, wholly antithetic. If classical

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literature be sufficient to construct your spinning-jennies and bleach your cottons, your system of instruction is right; but if you are to be braced, and your sinews strengthened, for a hard struggle of industry, is it wise that you should devour poetry, while your competitors eat that which forms the muscle, and gives vigour to the sinews? With such different trainings, who in the end will win the race?" How can we, as a nation, expect to carry on those manufactures by our sons of industry, when we do not teach them the nature of the principles involved in their successful prosecution? The progress of science and industry, in countries which have reached a certain stage of civilization, ought naturally to be synonymous expressions, and hence it follows that it is essentially the policy of a nation to promote the one which forms the springs for the action of the other.

Manufacturing industry is one of the primary conditions on which our social system is based. Providence, in his beneficence, causes the earth to yield a variety of products for the benefit of man, nearly all of which require to go through a process of preparation and manufacture before they can be fitted for his use. Thus the raw material, as it comes from the hand of nature, is so fashioned by the skill and ingenuity of the artisan and the artist as to be converted into articles of great utility and value. England, in the wisdom of her government and people, has cultivated this branch of trade to such an extent, and brought it to so great a perfection, that her ships may be found on every sea, bringing to her shores the material and the ingredients, which she cannot produce at home. The vast extent of her operations, and her never-failing supply of money, enable her to command the markets of the world. Thus it is that, with a constant supply of coal at her very door, to heat her furnaces, the powerful aid of machinery, which she invents and constructs in her own workshops, and the skilled labour of her mechanics, she calls into existence fabrics, utensils, implements, ornaments, and works in every department of science and art, that, for utility, durability and cheapness, cannot be ex-

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celled. British America, though we are not altogether deficient in the raw material, the resources of the country have not been yet sufficiently developed to enable us to depend on our home supplies. We must still look to foreign countries for nearly all the articles that enter into our manufacturing operations. The machinery for our mills and factories chiefly comes from the United States. True, there exist in the Provinces many foundries and machine-shops; but, compared with those of our neighbours, they are in a somewhat rude and imperfect state. Nearly all the iron consumed in the country, and the quantity is considerable, is imported from Great Britain. Our own mines have not so far been made to yield anything like an adequate supply; and even if they did, we have neither smelting works, nor refining furnaces, to extract the iron and convert it into the raw material. Coal is to be found in abundance in Nova Scotia and Cape Breton; but the quality of the Scotch and English is so much superior, that it is more extensively consumed—an additional item of expense to the manufacturer. In the articles of soap and candles, the ingredients which are chiefly used in their composition— tallow, palm-oil, and wick—are imported from the States; as also corn, which enters largely into the manufacture of starch. As regards leather and wooden manufactures, we do enjoy some advantages, by producing the raw material in the country. Still, though our tanneries turn out good and durable hides, there is also a considerable demand for English and French leathers; and in the article of house furniture—a most important branch of Canadian industry—hair, damasks, canvas, veneers, springs, glass, varnish, paint and hardware, are all imported. Indeed, so much do these articles enhance the cost of cabinet-ware, that our manufactures have been unable to compete against the fifteen per cent, duty, which the Lower Provinces have maintained against us. Essential as it may be to establish thorough free-trade between the Provinces, it is unquestionably true that the extension of the principle to other nations would, at present, bring nothing but disaster upon our industry.

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In discussing this most interesting question, we must not overlook the fact, that we have at our door a powerful and enterprising nation,—rich in all the varied resources necessary to raise her to the highest point of excellence and prosperity in manufacturing industry. Proud as we are, and ought to be, of the many advantages we enjoy in British America, we must not despise the lessons which the history of that great country teaches us, nor appear insensible to the influence her future career may have upon our commerce. Thirty millions of people, ingenious, intelligent and industrious, inhabiting a country of vast extent and wealth, and with almost unlimited powers of production, cannot possibly remain dependent for any great length of time upon the supplies of a foreign nation. In addition to the many facilities they possess for the prosecution of a manufacturing trade, the natural tendency of the people is to render themselves thoroughly independent of others, and to build up a powerful and permanent industrial interest in the state. With the return of peace, and the re-establishment of open communication with the South, enterprises hitherto abandoned, or newly projected, will spring into life and activity. The protection and encouragement which their manufacturers needed and sought before the war, the war has necessitated, and henceforth a high tariff may be regarded as the accepted policy of the country; and, in addition to the numerous articles produced at present, they will hereafter look more to their own spindles and looms for the finer as well as the coarser fabrics worn by the people. It would be highly interesting, did time permit, to record a brief history of the rise and progress of American manufactures—the policy pursued, and the result to the country. It would give weight and force to this Essay, and present a picture of prosperity unexampled in the history of the world When it is stated that the United States have a capital of $200,500,000 in manufactories, employ nearly two million hands, and produce annually the enormous value of two thousand millions of dollars in manufactured articles alone, some idea may be formed of the present

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extent of that great branch of industry, and how futile the attempt would be for British America to attempt to compete with her. Why, it is admitted to-day that, notwithstanding the high pre-eminence to which English manufactures have arrived, it is doubtful whether England will be able to maintain her ability to cope with foreign nations. The Americans are becoming powerful rivals. No other country can purchase cotton so cheap—no other country has such extensive water privileges; and the enormous increase in the coke and bituminous coal production and iron of the country, are sources of manufacture, that require only capital and enterprise to convert them into mines of wealth, and that must increase her powers of competition to an almost unlimited extent. In addition to all this, the policy of the American Government has been eminently protective. Washington and Jefferson first turned the attention of the people to the cultivation of such articles as formed the basis for domestic manufactures; and from that date *(1774)* to the present the United States have, with some exceptions, maintained that manufactures were as necessary to their independence as to their comfort, and have directed their legislation so as to foster and promote them. The manufacturing interests in the Union are to-day clamorous for increased protection, and if the tariff bill recently before Congress is passed into law, they will enjoy a discriminating duty of fifty to one hundred per cent. It is clear, therefore, that "British Americans" will not be able, for many years to come, to enter the field of competition with the United States. What, then, is the duty of the people of these Provinces? Let us inquire.

The commercial history of the world is full of instruction to the new, and one of the most important lessons to be learnt from it is this,—that wherever, amongst an industrious people, manufactures have been established, and science and art have been involved as an element of their progress, that nation which most cultivated them has been in the ascendant. England, France, Belgium and Germany are bright examples of the truth of the assertion, and the growing greatness of the Anglo-Saxon races on this

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continent furnishes an additional proof. If, therefore, we would build up and strengthen this new nationality about to be conferred on us; if we would bind together, in bonds, which cannot be severed, the affections and interest of the people, and give force and vitality to their energies; if we would create a spirit of self-reliance and independence among our race; if we would offer tangible inducements to the old country artisan to settle amongst us, and give us the benefit of his skill and labour, if not his money,—we must open up all the resources of the nation, and encourage and protect all the varied branches of manufacturing industry. The population of our cities, growing as they are, must be employed; occupation must be afforded, during our long and cold winters, to the large majority of those who inhabit our towns; and the only effectual mode of doing this is by keeping alive the workshop, the factory, and the mill. Absolute free-trade would crush these out, and their ruin would be disastrous to our future welfare. Rich and extensive as are our agricultural lands, the best quality of them are now under cultivation, and the government are nearly sold out. Our timber forests, vast and valuable as they are, cannot last for ever. Like the coal of England, they are doomed to exhaustion; and when that day comes, if our manufacturing industry has been neglected, what shall we give our people to do? This is a serious question for the consideration of our statesmen and intelligent business men. Protection to-day is not the monster it was when England groaned under heavy taxes, and struggled to be free. Protection to-day does not mean enormous excise duties and prohibitory laws. It means, in these Provinces at least, if our rulers are wise, the largest amount of freedom, with the lightest sum of taxation—prudence and economy in the management of the public finances—every branch of commerce unfettered and free from oppressive burdens—freedom of intercolonial trade in the largest acceptation of the term, and a fair, just and moderate protection to native industry. Under such a policy "British America" would continue to advance with rapid strides, and, relying

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on her own strong arm, and the ever-ruling wisdom of Providence, may we not hope that he who lives to look back upon the next half century will be able to do so with feelings of pride and thankfulness as strong and cheering as those which actuate him who to-day is permitted to review the history of the last fifty years.

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APPENDIX.

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REPORT OF THE COUNCIL

OF THE

Literary and Historical Society of Quebec,

FOR THE

YEAR ENDING 31st DECEMBER, 1866.

THE Council has the honor to submit the following Report:—

It may be remembered that, in the last year's Report, the Council had to regret a serious falling off in the list of members, by the withdrawal of some from the Society, and the removal of no less than thirty others to Ottawa; but it is satisfactory now to report, that the hope then expressed has been more than realised, and that the Society at present shews a list, in numbers and standing, all that could be desired. The Treasurer's account shews 122 members who have paid dues up to 31st ultimo.

The stated meetings, and nearly as many extraordinary, have been regularly held and well attended, and papers, as subjoined, have been read; and it will be observed, with pleasure, that Part IV. of the News Series of the Transactions contains papers of much interest and practical bearing on matters immediately connected with the Province—two of them being in French; and papers have been promised for the remainder of the Session.

The arrangement with Morrin College proved mutually advantageous, the Council trust it will be maintained till either of the parties shall have provided itself with a suitable building which it can call its own.

The Council having received a proposition from the Board of Directors of the Quebec Library Association, for the transfer of their Library to the Literary and Historical Society, for the nominal sum of $500; the object being to prevent the dispersion of a very valuable collection, they appointed a committee consisting of the President, Captain Ashe, Dr. Anderson, Rev. J. Douglas, C. G. Holt, and T. Fournier, Esqs., to meet the Board, ascertain the condition of the Library, and discuss details; and, on their report, an

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[illegible]

[illegible]

Literary and Historical Society of Quebec,

[illegible]

[illegible]

The Council [illegible] to submit the following Report:—

It may be remembered that in last year's Report, the Council had to report a serious falling off in the list of members, by the withdrawal of some from the Society, and the removal of no less than [illegible] others to Ottawa; but it is satisfactory now to report, that the loss then experienced has been more than realized, and that the Society at present shows a list, in numbers and standing, of [illegible] that could be desired. The Treasurer's account shows that members who have [illegible] up to this [illegible].

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extraordinary general meeting was held, which unanimously sanctioned the purchase, and, in accordance with a resolution then passed, the transfer has been completed, and the Library handed over to Dr. Anderson, as the representative of the Literary and Historical Society, by the proper officers of the Quebec Library Association. The Council will have to make arrangements for the selection and removal to these rooms of such books as it will be found expedient to retain, and the rest will be sold either by private sale or public auction, as may be deemed most advantageous.

The Council take this opportunity of submitting to the consideration of the Society, whether the time has not now arrived when it has become necessary to appoint a paid sub-Librarian, who should attend in the Library, receive and deliver the books, and make proper entries.

The Treasurer's account of last year shewed an apparent balance in favor of the Society of $670.86. This balance, however ,was only apparent, as there remained unsettled accounts which the Council had to meet, amounting to the sum of $328.63. Notwithstanding this, and the very large outlay incurred in the purchase of the Library of the Quebec Library Association, the Treasurer's account for this year shews a very satisfactory balance, which, as the Council believes, can only be reduced by one half-year's rent past due Morrin College on November last, amounting to $60, and certain current expenses, which will not exceed $100 more.

There now stands to the credit of the Society the sum of $621.96, composed as follows:—

Historical Document Fund	$154.67
Life Members' Fund	54.65
General Fund	412.64
	$621.96

During the past year the Society has had to deplore the loss of one of its oldest and most distinguished members, George B. Faribault, Esquire. Mr Faribault was for many years President of the Society, and was widely known for his valuable contributions to Canadian History. The publication of the Memoirs of the Sieur de Ramsay, under the auspices of the Society, in 1861, was mainly due to him; as was also the procuring from St. Malo of very valuable Correspondence and Documents. He died full of years and honor; and the Society has the gratification of possessing a striking portrait of him, which they trust will always grace the Library while the Society continues to exist.

They have also to lament the death of another former Member, M. F. X. Garneau, Esquire, the historian, who was prematurely cut off in the midst of his usefulness.

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In conclusion, the Council have much pleasure in adopting the closing paragraph of last year's Report:—"So many new members have been elected, and so hearty a determination has been shown to work vigorously and maintain its character, that we have no fears lest failure and decline should succeed the prosperity of the last few years."

E. D. ASHE.

PAPERS READ BEFORE THE SOCIETY.

1866.

Janv. 17.—By N. H. Bowen, Esq.—"On Music, as a branch of Education."

" 13.—By L. Berthelotte, Esq.—"On Animal Magnetism."

Feby 7.—By The Bishop of Quebec.—"On Ancient English Poetry."

" 21.—By J. W. Cook, Esq.—"On Canadian History."

Marcr 7.—By E. D. Ashe., Esq.—"On Insurrection in Jamaica of to-day compared with that of 1852."

" 21.—By Hector Fabre, Esq.—"On Litterature Canadienne."

April 4.—By F. Austin, Esquire.—"On some of the Fishes of the St. Lawrence."

Novr 7.—By E. D. Ashe, Esq.—"On Solar Spots."

" 21.—By Rev. Mr. Sherring.—"On India."

Decr. 5.—By Rev. E. Hatch.—"On the History of the Alphabet."

" 19.—By Dr. Anderson.—"On Canadian History and Biography, and passages in the lives of a British Prince and a Canadian Seigneur.

" 26.—By Capt. Faucher de St. Maurice.—"On the Mission of the Man of Letters in Modern Society."

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Dr. The Treasurer in account with the Quebec Literary and Historical Society Cr.

1866.			
Jany. 1.– To Balance from 1865, viz.:—			
General Fund	$427 04		
Historical Document Fund	189 17		
Life Member's Fund	54 65		
		$ 670 86	
Nov. 10.—To Government Grant		750 00	
To Subscriptions received from Members		601 00	
To Interest on Balances		12 07	
To Sale of Historical Documents		10 00	
		$2043 93	

1866.			
Jan. 1 to Dec. 31. By Books, Periodicals, and Binding	$239 46		
By Purchase of Quebec Library	500 00		
		$ 739 46	
" By Specimens for Museum		50 15	
" By Printing Transactions		97 50	
" By Furniture, Shelves, &c., for Museum and Library		55 25	
" By Advertising		54 30	
" By Insurance		53 77	
" By Balance of Rent to Morrin College (expended in books)		150 07	
" By Gas, Fuel, and Water		45 78	
" By Collector's Commission		20 80	
" By Discount on Silver		16 00	
" By Assistant Secretary		40 50	
" By Petty expenses, Postages, and Express charges		33 84	
" By Balance of Refreshments account (1865)		11 05	
" By Printing Historical Documents		44 50	
" By Balance in Quebec Provident and Savings' Bank, viz:—			
Historical Document Fund	154 67		
Life Members' Fund	54 65		
General Fund	412 64		
		621 96	
		$2043 93	

E. & O. E.

Quebec, 31st December, 1866.

HENRY FRY, Treasurer.

We hereby certify that we have examined the Treasurer's foregoing account with the vouchers for 1866, and found the same correct. The whole balance, $621.96, is on deposit with the Quebec Provident and Savings' Bank.

Quebec, January, 1867.

D. WILKIE, J.HORAN, Auditors.

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LIST OF MEMBERS.

Life Member.

THOMAS GLOVER, Esquire.

Associate Members.

Archbishop of Quebec.
Archer, Joseph, junior.
Alleyn H. C.
Austin, H. C.
Austin, F. W. G.
Anderson, W. J.
Ashe, E. D.

Blanchet, H.
Breakey, W.
Bennett, Benson.
Belleau, Jas. F.
Blanchet, J. B., M. D.
Budden, J. S.
Bossé, Hon. J. G.
Boswell, J. K.
Baby, M. W.
Baillargé, L. G.
Bertolotto,
Burroughs, J. H. R.
Baillargé, C.
Bedard, W.
Buchanan, A. C.
Burroughs, E.
Bowen, N. H.

Campbell, Arch.
Caron, Adolph.
Clark, W. B.
Chinic, E.
Cauchon, Hon. Joseph.
Caron, L. B.
Casault, L. B.
Colston, J. G.
Couper, Wm.
Campbell, W. D.
Cary, G. T.
Chessar, Wm.

Dawson, S. J.
Drapeau, S.
Dunscomb, J. W.
Doucet, P. A.
Dunbar, J.
Dunn, W.
Delagrave, C.
Douglas, J. junior.

Ely, John A.

Fraser, Alex.
Fothergill, Rev. M. M.
Foote, T. J.
Fiset, L. J. C.
Fabre, Hector.
Fry, H.
Fournier, T.
Fraser, A.
Fitzgerald, C. J.
Forsyth, J. B.
Faucher de St. Maurice.
Fry, E. C.
Fry, J. S.

Gibb, James.
Gregory, J. U.
Geibb, James, junior.
Goldstone, George.
Gethings, H. R.
Gibsone, Geo. C.
Gourdeau, F.
Gilmour, John.
Glass, John.
Garneau, P.
Gleason, John.
Grant, T. H.

Hall, G. B.
Home, G. R.
Harrison, R. M.
Hamilton, Rev. Chas.
Hamilton, Robt.
Hearn, M. A.
Hunt, Weston.
Harrower, J. T.
Hart, Geo.
Horan, J.
Hossack, Jas.
Hossack, W.
Holt, C. G.

Irvine, Geo.

Joseph, A.
Jackson, A. H.
Johnstone, Peter.
Jolicoeur, P. J.
Joly, H. G.

Larue, J. E.
Lemesurier, John.
Landry J. E., M. D.
LeSueur, P.
Legaré, M. D.
Langlois, C. B.
Laidlaw, Thos.
Lemieux, C. E., M. D.
Larue, G. H.
Langlois, J.
LeMoine, J. M.
LeMoine, Gaspard.
LeDroit, T.

Murray, D.
Murphy, O.
Maxham, A. J.
Miller, M.
Mills, J. W.
Michon, E.
McAdams, W. J.
Macauley, S. S.
Mountain, M. G.
McNaugton, P.
Moodie, Walter
Montizambert, C. N.
Marsden, W., M. D.
McNaugton, John.
McBlain, H.
McGreevy, Thos.
Montizambert, F., M. D.

Patton, Duncan.
Panet, Louis.
Parke, Jas., junior.
Paradis, O. E.
Poston, W.
Peters, H. J.
Peebles, P.
Plamondon, A.

Quebec, J. W.

Reynar, Joseph.
Ross, H. D.
Ross, Thos.
Richardson, J. R., M. D.
Renaud, J. B.
Richardson, O. L., junior.
Renault, Aug.
Renault, A., M. D.
Ray, W. G.
Rowand, A., M. D.

Sewell, J. A., M. D.
Shaw, P. A.
Simons, W.
Stevenson, J.
Sheppard, W. G.
Stevenson, M
Shaw, Robt.
Scott, W. C.
Scott, H. S.
Sewell, J. A., junior, M.D.

Thomson, Andrew.
Turnbull, J. F.
Thomson, D. C.
Taylor, Femings.
Tessier, P. O., M. D.
Thibaudeau, Hon. I.
Tetu, L.
Tessier, C.
Tachereau, H. J.
Tessier, Hon. U. J.
Taschereau, H. E.
Tetu, C.

Vannovous, F. C.
Vallée, Prudent.
Valleau, W. B.

Webster, A. D.
Wotherspoon, I. T.
Wood, Geo.
Wheeler, Alfred.
Wicksteed, R. J.
Wilkinson, J. B.
Wilkie, C.
White, W.
Walker, W. A.
Wurtele, R. H.
Wilkie, D.

Young, J. R.

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